



CHEETAL

JOURNAL OF

The Wildlife Preservation Society of India

Dehradun

Vol. 47

January 09(May 08 to Dec 08)

Nos.1&2



Hyena

Photo By Rajeev Raj Mehta

*Published with partial financial assistance of
Uttarakhand State Council for Science & Technology (UCOST)*



Dancing Peacock- Rajaji National Park Uttarakhand

Photo - A.S. Negi



Himalayan Marmot (*Marmota himalayana*) Photographed
near Khardhungla pass in Ladakh (18380 feet)

Photo - A.S. Negi

Editorial

Shall I Tell You

Simm Barhes

About this peregrine falcon I saw? Oh god, I can hear your groan, cruel beak, hooked talons sinister silhouette, death from clear sky, Yeah Yeah Yeah- Why do people go on about birds of prey so much? What's wrong with all the other groups?

But the best nature poem ever written (you can remove the word nature from this sentence if you wish) was by Gerard Manley Hopkins and it was about a kestrel, not a wren. Heraldry is full of eagles, not starlings. American football teams include Eagles, Seahawks and Falcons, but no sparrows. Ask about great birding moments, more people than not will tell you about or thunderclap vision of a bird of prey.

In ancient times, the gentry rode about with birds of prey on their wrists, not crows: they went in for falconry, not corvidry. I spent a day at a bird of prey centre (all good captive-bred birds) and it was pretty wonderful to stand there as a tawny eagle with a six foot wing span lands on your wrist and clouts you over the head with a negligent wing is not a small experience.

But perhaps this birds of prey thing is a bit crass. Perhaps it is all a bit Jeremy Clarkson: falcons as boy's toys: fast fierce, cool: everything an uncool chap world likes to be. Talking about peregrines can come across like an idiot gushing about his Ferrari.

Let me go back to that tawny eagle moment. I had this great bird on my fist, and though built for the air, it was not light. That ferocious yellow eye was less than a foot from my own: rather nearer was that even more ferocious yellow beak. It was an intimate experience of nature's ferocity.

And as I gazed, I knew that this was also the most fragile bird in the world. That is what being a bird of prey means. Even without human intervention a bird of prey is the most endangered bird in his ecosystem: and the behavior of human beings at least doubles the danger.

The bigger and fiercer you are, the rarer you must be: a basic rule of ecology. In a wood, there will be millions of caterpillars. They will be eaten by dozens of blue tits; the blue tits will be eaten by a single pair of sparrow hawks. If there is a terrible year for caterpillars, you will end up with a mere hand full of blue tits. You will also end up with no sparrow hawks at all. The blue tits will recover the sparrow hawks are gone. So if humans chop down half the wood, there will still be caterpillars and blue tits but the wood is no longer big enough to support enough blue tits to feed a single family of sparrow hawks.

But the thing can work the other way. If you have a successful pair of sparrow hawks, what does it say about your wood? It says that it is in very good shape: if it wasn't it couldn't support the sparrow hawks. So every time you see a bird of prey, it is the most clear and obvious sign that the place you are in is doing all right.

Even in the best of all possible worlds, birds of prey have the toughest job. It is made even harder because humans kill them. They are shot, illegally, because they conflict with the interests of shooting people. Falcons are shot by pigeon fanciers. Hens harriers' nests are stomped by

gamekeepers. People leave out poisoned carcasses, to get foxes and crows: birds of prey are accidental victims.

Perhaps the biggest single change in conservation in this country came when certain pesticides were outlawed in the 1960s. The real victims of the pesticides were birds of prey: as the poisons built up in the ecosystem, our best species were driven to the edge of extinction. Their recovery is one of the glories of 21st century Britain.

So yes, birds of prey have it tough from every direction. Nature gave them a hard job and humans have made it ten times harder. Every living, breeding, surviving bird of prey is a triumph against the odds. If we want to celebrate their ferocity, we must also celebrate their fragility.

If an organization like the RSPB seems to give excessive attention to birds of prey, it is because birds of prey have a significance that other groups do not. If you are to get a place right – or keep a place right – for birds of prey, you must look after absolutely everything. You must start at the bottom of the food chain, and cherish every creature all the way up: because if you don't, there will be nothing at the top.

Birds of prey are the ultimate contradiction of conservation: what we celebrate as the most wild and fierce creature of them all is the one that most desperately needs our protection-not because the birds are inadequate but because we are: we are inadequate at looking after our own planet.

To cherish birds of prey is to cherish everything. Birds of prey need everything to be right: and when you set eyes on one, it is a celebration of the rightness and perfection of absolutely everything. Hopkins knew that: "My heart in hiding/Stirred for a bird, - the achieve of, the mastery of the thing."

Taken from unknown news clipping

Note: This article on Birds of Prey gives a deep insight of these spectacular bird species. The survival of these species is vital for ecological equilibrium

A.S. Negi

Letters to The Editor

Respected Sir,

I would like to thank you for organising such a lovely trek to Dodital. The trek was once again a fantastic learning experience for me.

My initial interest in the trek was fishing trout (catch and release) and it came as a disappointment when I was told that trout fishing had been banned in the lake four year ago.

I was never the less rewarded in another manner.

As three members of the group (Mr Mansoor from Murdabad, Sanjay Rawat and I) were a couple of kilometers short of Dodital, we saw the king of all pheasant's flutter across the ridge into the thick jungles below. My initial reaction to the bird was "look peacock" but it was only after the bird displayed all its beautiful colours; that I realised this was not a peacock (with an amputated tail) but the state bird of Uttarakhand—The Monal.

A majestic bird I had only seen in books, was now in flesh and blood flying across us.

He must have given us just a few seconds to see him, but this is a memory I shall cherish for a long time to come.

Thank you once again,

Yours faithfully,
Dr. Prashant Singh

PO Pallia - 262902

Dist. Kheri (UP)

Dated 24/9/08

Dear Mr. Negi,

Very many thanks for sending me a copy complimentary of the Cheetal., Though in my nineties, and claiming to be a Pioneer of the Wild Life effort it is my regret that I can no longer participate to any degree of activity in conservation effort. I wish to add my entire agreement to view of opposition to the so called Tribal Rights Act, and I wish the Activists. All success.

However I am desirous of expressing my views on Gharial Mortality, which may be due to its fish eating specialty and the indiscriminate poisoning by fishermen in pursuit of their traditional Trade Auctions of previous years which needs strict control. The death of one solitary 'magar' may be indicative vs 200 gharial.

Thanking you once again for your consideration.

Regards, Yours sincerely

ARJAN SINGH

PS Fish poisoning is a regular practice in Kheri Dist UP

Sir,

My participation in treks with you seem to be jinxed. I have recently suffered from an attack of left sciatica. Although I am better now but the medical authorities in the MH have advised to have total limb rest for 15 days. I had conveyed this to Priyanka couple of days back telephonically and requested her to take my name off the roll. Mr. T.S. Rawat will also not be coming. I am sorry to have ditched your efforts the second time. Sincerely,

Dr. R.S. Negi

Contents

1	SEASONAL MONSOONAL MIGRATION OF GANGES RIVER DOLPHIN IN KARNALI RIVER AND FEEDER STREAMS OF NEPAL	Dr. Tej Kumar Shrestha	1-15
2	MATERNAL BEHAVIOUR IN HANUMAN LANGURS, <i>SEMNOPITHECUS ENTELLUS</i> AROUND JODHPUR	L.S. Rajpurohit, Gautam Sharma and Bharti Sharma	16-25
3	GOLDEN LANGUR: THREAT AND CONSERVATION	J.P. Sati	26-30
4	SAVING THE TIGER	Lt Gen (Retd.) Baljit Singh	31-32
5	TREKKING IN LADAKH	Kunwar Atul Raj Singh	33-36
6	HAATHI KE DDANT (IVORY)	Dr. Prasant Singh	37-38
7	AN ALARM CALL OF BARKING DEER	A.M.K. Bharos Akhilesh V. Bharos	39
8	PRIVATE GAME RESERVES	Dr. Prashant Singh	40-42
9	<i>From the Archives of "Cheetal"</i> HUMANE DESTRUCTION OF ELEPHANTS	P.D. STRACEY	43-45
10	<i>"Cheetal" quarterly News</i>		46-54
	<i>"Cheetal" Young Readers Section</i>		
11	ORNITHOLOGY IN INDIA: A BRIEF HISTORY		55-58
12	उड़ने वाली गिलहरी क्या है?		59
13	जलवायु परिवर्तनों पर रखे नजर	पूनम जैन	60-61
14	WILDLIFE PHOT SERIES FOR IDENTIFICATION		62-63

Cover Page

Hyena

Family Name Hyaena hyaena

IUCN/WPA Lower risk/III

Local Status Uncommon

Population Unknown

Social Unit Solitary / Family Groups

Diet Carrion

Activity Nocturnal

Local Name Lakkar Bagga (Hindi)

Description Ungainly skulking scavenger with slopping back spindly legs, a buff body with black strips on the flanks and legs, and coarse, long fur, The back has dark crest & the throat & breast are black

Behaviour Laughing call that ends in a cackle

Size Total body length 150-160 Cm. Weight 26-41 Kgs.

Habits Scrub forests and near human habitation

Meeting of General Body Notice

All the members of Wildlife Preservation Society of India, Dehra Dun are hereby informed that a meeting of the General Body of the Society will be held on thursday the 19th February 2009 at its office at 7 A -Astley Hall, Dehra Dun at 11 A.M. Among other things the election of Executive Committee of the Society will also be discussed. Honourable members are requested to take part in maximum numbers. Those unabl to participate may send their points for discussion to the Executive Vice President by post or email (priyanka_negi@rediffmail.com)

A.S. Negi
Executive Vice President

Seasonal Monsoonal Migration of Ganges River Dolphin in Karnali River and Feeder Streams of Nepal

*Dr. Tej Kumar Shrestha,

Abstract

Migration of Ganges river dolphin (*Platanista gangetica*) was studied in the Karnali river and its feeder streams of Nepal. Results demonstrate that dolphin strictly follow prespawning migration of fishes during June and post-spawning migration in November. Result shows that dolphin remain in headwater feeding ground of Karnali tributaries from June to October and return to main river Karnali in November. In future, additional conservation measure will be required to safeguard migratory dolphin population in main river and tributaries. However, studies of free ranging migratory dolphin are rarely undertaken in Nepal because such observation in flooded river of monsoon is extremely difficult and risky.

Introduction

Although Anderson (1878), Pilleri (1970), Kasya and Haque (1972), Shrestha (1995) made an intensive study on the distribution of Ganges river dolphin distribution and biology of dolphins, except for the distribution, status and ecology of Ganges river dolphin there is little information on migration and behaviour. Studies on migratory behaviour is made to assist formulation of monitoring management and conservation of migratory dolphin population. At, present author takes an opportunity to report migration of Ganges river dolphin in the feeder streams of the Karnali river (Fig. 1). This report is based on observation made on June 2003 to May 2006.

Nepal lies on the southern slope of the Himalayas. There are four major river systems of Nepal, which arise from the Himalayas and are constantly fed by melting snow, glaciers, torrents and by seasonal rains. Nepal is drained by Karnali (Ghagra) and Mahakali (Sarada) in the western region. Besides these, Gandaki (Narayani) river drain in central Nepal and Koshi in eastern Nepal. All of the river systems join Ganges river system of India. The upper and middle reaches to all the river are torrential, low temperature and current is barrier for the distribution of Ganges river dolphins. The lower reaches of the river is admirably suitable for the survival of dolphin. Erection of major power-dams in lower reaches towards Indo-Nepal border are posing great threat for the seasonal migration of dolphin in Nepal. Nepalese rivers and their tributaries provide hydrographically unique waterscapes, pools and rapids mitigating nursery habitat needs for juvenile and adult dolphins. Presence of Kailashpuri and Girijapuri dams in Indo-Nepal border have checked movement, population growth and intermixing of upriver and downriver population. Dolphins also have been target of hunters and fishermen in spillway and tailwater of the dam during low water phase of the river. Fishermen take advantage of dolphin's seasonal migratory behaviour and are heavily exploited for oil in Indo-Nepal border (Table 1).

*Head Central Department of Zoology, Tribhuvan University, G. P.O. Box. 6133, Kathmandu, Nepal.

Table 1 Ganges River Dolphin Life Table

Scientific Name	<i>Platanista gangetica</i>
Status	Endangered
Habitat	Freshwater
Weight	82 to 150 kg
Size	1.5m - 2.5m
Longevity	About 28-30 years
Diet	Fish, shrimp, crab, mollusks and aquatic Invertebrates
Habits	Seasonal changes in habitat and movements of Gangetic dolphins are not well documented, but there is clear evidence of seasonal distribution and migration of dolphin traveling upstream as water level rises and entering feeder streams and traveling downstream as water level fall or subsides (Shrestha, 1995).
Birth Season	Females produce young at any time of the year with peak in May and June (Shrestha, 1995).
Gestation period	Approximately 1 year
Birth rate	As a rule single young is born some time twin are also born
Early Development	At the age of 6 months of the birth, the young starts accepting solid food.

Mohana River as Principal Feeder Stream and Monsoon Resort of Dolphin

Mohana river is a headwater feeder stream of the Karnali river supporting high density of migratory population of dolphin. It runs along the border of Kailali district and the Indian border before joining the Karnali river at Chaugurdighat. During its course through Kailali it is fed by many small streams such as Turila, Mohana, Godavari, Khutia, Surmi, Kanari, Tengna, Kada, Kanara, Pathariya and Ghuraha. All these feeder streams of Mohana flow southwards from the foothills of the Churia range in Kailali. All these small tributaries of Mohana and the river Mohana itself has very shallow and hold variable amount of flow during the dry periods. During onset of monsoon, Mohana holds bankful water with higher flow and swift current. River Kanara joins, Mohana at Madiyaghat. Kanda and Pathariaya river join at Baradahawaghat before they flow into Mohana at Mohana-Pathariya confluence, near south of Bardahawaghat. Migratory population of dolphin join fish migration in these rivers. Both young and adult dolphin are seen hunting fishes in all these feeder streams with great excitement at Kusumghat. Mohana drain along the Indo-Nepal boarder eastwards to unite with the Kauralia branch of Karnali river at Chaugurdighat. I counted regularly 12 dolphins in August 2003, near Kusumghat ferry but local people tell that they encounter each day 30-50 dolphins during high flood.

Methods

A transect was established to study migratory movement of dolphins and population changes in the Karnali river and its feeder streams. It is a simple procedure to establish number of transect of straight lines across the river channel perpendicular to flow. These transects were established at two river confluences.

Dolphin surveys were conducted along Karnali River and its tributaries particularly in Mohana river in different seasons. Intensive surveys were carried out by rowboat along the channel of the Karnali and its feeder stream. During each survey, the river was covered twice, once moving upstream and once downstream. Studies were made at various times in the Kaurelia, Mohana and Grewa branches of the Karnali and their confluence site and the main Karnali river. In the Karnali surveys, dolphins were counted from the banks of the river using 7X35 binoculars and a camera with a 200 500 mm telephoto lens equipped with a power winder and 400-1000 ASA film. The surveys were made from both banks of the river simultaneously, with three observers on each bank recording surfacing and diving times with a tape recorder and counting the dolphins. When conditions were suitable, a video camera was used to record surface activity; the video were also examined to confirm counts of surfacing dolphins. At the time when the riverbanks were inaccessible due to flooding, observations were made from an elephant back or elevated cliff. Polaroid sunglasses were used to combat the intense glare on the river at mid-day. Nine survey points were used; all were covered in a single day, during daylight hours. Between 30 and 60 minutes were spent at each survey point. The dolphins were counted only after considerable time had been spent observing size, shape, colour and natural marks of the individual animals, to avoid counting the same individuals. A theodolite was used to measure width of the river, dimensions of pools, etc. Detailed environmental and hydrological data were collected during the surveys are summarized in a form of Hydrograph (Fig. 2).

During the surveys and collection of reports, people living near the river and local wildlife officials were interviewed and asked for information about sightings of dolphins. They were shown photographs of the Susu to avoid confusion with various large fishes and crocodiles that inhabit the river. The Ganges river dolphins that are killed due to flood event were dissected and their gut content and were also examined for fish food taken by them (Table 4).

Ecological study on migration of Gangetic dolphin (*Platanista gangetica*) was conducted between June 2003 to May 2006 in the Karnali river of Nepal. The dolphins were abundant in the river twenty years ago. The Karnali river holdsnow residual population of dolphins fewer than 12 individuals. But in wet season more than 32 individuals may be counted during upstream migratory run in June and July. Many parts of riverine habitat are further fragmented due to the changing water table and dewatering effects. Some populations of dolphins are however present at lower reaches of Karnali river near Kothiaghat. Industrial pollution, extensive use of agricultural pesticides, harmful fishing practices (gill netting, drift netting) and barrier effects of dam probably caused rapid decline of dolphin. But the habitat destruction is increasingly important near Indo-Nepal border where habitat is poor and human disturbance assumes greater significance. There is no evidence of food competition with twin river species such as Mugger (*Crocodilus palustris*) and Gharial (*Gavialis gangeticus*) crocodiles. The dolphin is now protected species by law but illegal netting and killing takes place at night along Indo-Nepal border. Dolphins are occasionally killed when they get stranded in shallow water during September. They become easy target of spear and bow and arrow. The

steep decline in this internationally important Ganges river dolphin is of great concern. There is an urgent need for research, development plan of Nepal Government for holistic preservation of riverine habitats e.g., invertebrates, fishes and abiotic components etc.

Observation

The Gangetic dolphin are active both night and day. They typically travel slowly 8 to 25 km in a small, tightly knit group along the river channels, hunting, chasing migratory fish. The dolphins feed in larger groups, apparently in more coordinated fashion, when they are in shallow water tributaries. Their movement may be correlated with spawning movement of cyprinid fish, the mahseer (*Tor tor*, *T. putitora*), which is their principal prey. Fishermen also report that dolphin and mahseer arrive onto confluence site of main river and tributary with the advancing flood and use their flexible body and beak for chasing and rounding the catch. Fishing groups of dolphins make a tight circle around the school of spawning fish, show their back and pointed beak, lash their fluke through the middle of the circle and launches a fish through the air ahead of dolphins. This behaviour is known as "fish kicking".

Migration and Spawning of Mahseer and Dolphin

Migration and spawning of mahseer proceeds in groups. Especially large individuals showed up in early monsoon (June-July) and traveled each day about 10km with dolphin. The smaller mature group of male and female who reached first maturity followed by larger groups in July-August. They spawn during the height of flood. Spawners stayed in the spawning creek and confluence site of river, feeder stream and creek till the peak hydroperiod of monsoon flood. As monsoon water is withdrawn in October post-spawned fish return downstream feeding ground of the Karnali river with dolphins.

Most of mahseer showed upstream spawning with maximum length of 20 km to 50 km. They spawned 3-5 times in feeder stream or creek joining the main channel of the Karnali river i.e., mostly near confluence sites. Spawning grounds are characterized by a current velocity 0.5 m/sec, shallow depth (0.1-0.8 m/s) and gravel bottom, where most eggs adhered. It is remarkable that the deep bodied mahseer spawned each time together at the same ground. During the incubation period of spawned eggs, the water level fell-down and some part of spawning ground where dry and dewatered and a lot of embryo dead.

The feeding activity of dolphin could be best seen during winter due to high transparency of the river water. Feeding activity is best recorded during the winter. Although it was difficult to determine all spawning species of fish that dolphin feed upon during the flood, it is note worthy that of large number of small cyprinids such as Galphulani (*Ambypharygodon mola*), Marod (*Aspidoparia morar*), mrigal (*Cirrhinus mrigala*), Kalonch (*Labeo calbasu*), stone roller (*Crossocheilus latius*), Glass perch (*Ambassis nama*), mud perch (*Nandus nandus*), barb (*Puntius sarana*, *P. ticto*, *P. sophore*) were abundant in the feeder streams where dolphins were feeding actively (Table 4). Some fishes injured by dolphin teeth and many that have escaped from capture of juvenile dolphins were also collected. In June and July I found that females of most of fish species contained ripe eggs in the running condition evidencing the breeding season of fish. The tooth marks on escaped spawners gave indication that the particular species was most favourite food of dolphin. After the water level subsided during November these species could no longer be found in the feeder streams, the appearance of fry in the river bank indicated that spawning has taken place. Fisherman fishing there with down river facing trap also supported our

observation, that these spawning fishes migrated downstream of the Karnali river. At the time of retreat of flood most female fish have had spent ovary.

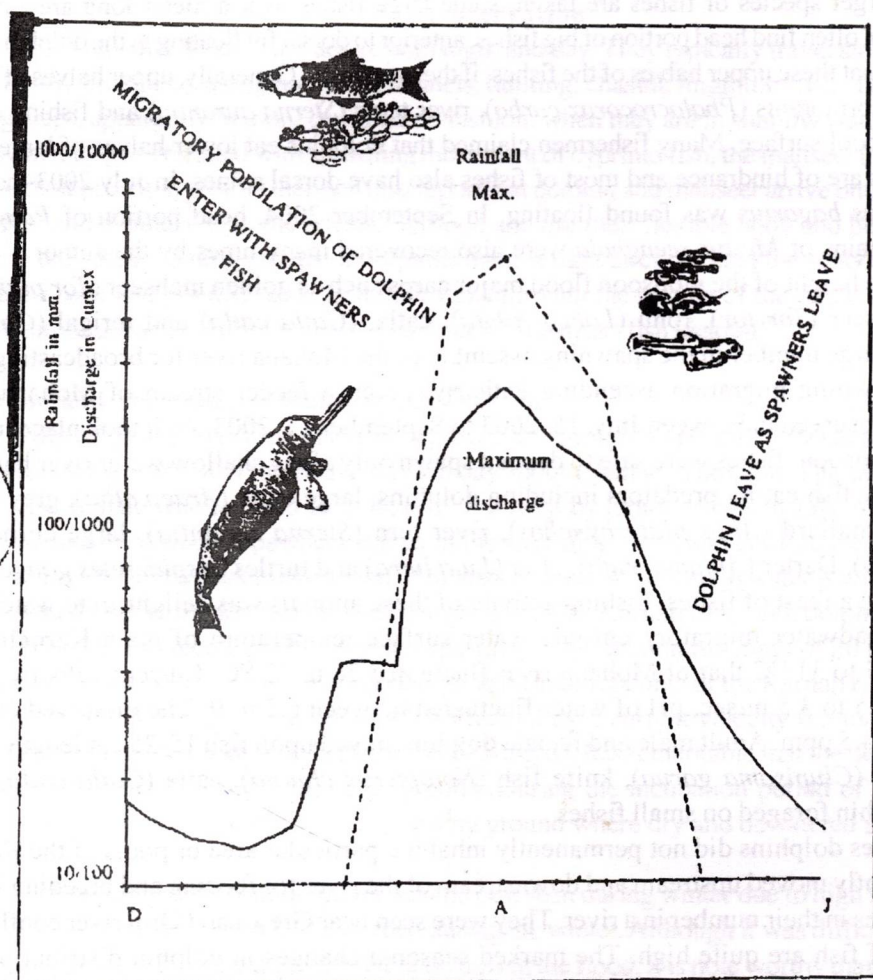
Although fishermen in the area believe that commercially important small fish make up an important part of dolphin diet, they also claim that dolphins feed on most of other species of cyprinid and silurid fishes as well. While local fishermen claim that minor cyprinids are swallowed by dolphins, they also report that lower halves of larger species of fishes are taken, some large fishes over a meter long are eaten by dolphins. Fishermen often find head portion of big fishes, anterior to dorsal fin floating in the dolphin pools. These poor people eat these upper halves of the fishes, if they are fresh. Generally, upper halves of fishes are also taken by cormorants (*Phalacrocorax carbo*), river terns (*Sterna aurantia*) and fishing eagles hovering near the pool surface. Many fishermen claimed that dolphins eat lower halves of larger fish, because dorsal fins are of hindrance and most of fishes also have dorsal spines. In July 2003 the head portion of *Bagarius bagarius* was found floating. In September 2004, head portion of *Pangasius pangasius* and remains of *Mystus seenghala* were also recovered many times by the author.

During the height of the monsoon flood major carps such as golden mahseer (*Tor putitora*), deep bodied mahseer (*Tor tor*), rohu (*Labeo rohita*), catla, (*Catla catla*) and mrigal (*Cirrhina mirgala*) enter in large number in the spawning assembly of the Mohana river for broadcasting their spawn. Three spawning migration ascending Pathariya river, a feeder stream of Mohana river confluence were observed in between July, 15, 2003 to September 15, 2003. As it took place in high flood period of monsoon, fishes were safe to deposit spawn only along shallow water river banks of depth 2-5 m. Many fish eating predators including dolphins, large egret (*Ardea alba*), grey heron (*Ardea cinerea*), mallard (*Anas platyrhynchos*), river tern (*Sterna aurantia*), large cormorant (*Phalacorax carbo*), Darter (*Anhinga rufa*), otter (*Luta lutra*) and turtles (*Aspideretes gangeticus*) were seen enjoying a feast of fishes. Fishing activity of these animals was delightful to watch.

During headwater migratory episode water surface temperature of main Karnali river fluctuated from 25 to 31 °C that of Mohana river fluctuated 26 to 32 °C. Current velocity in the Koshi river was 1.5 to 3.5 m/sec, pH of water fluctuated between 6.5 to 9. The dissolved oxygen reached almost to 4.5 ppm. Adult male and female dolphin preyed upon fish 15-25 cm length group such as jalkapoor (*Clupisoma garua*), knife fish (*Notopterus chitala*), catla (*Catla catla*). The young or calf dolphin foraged on small fishes.

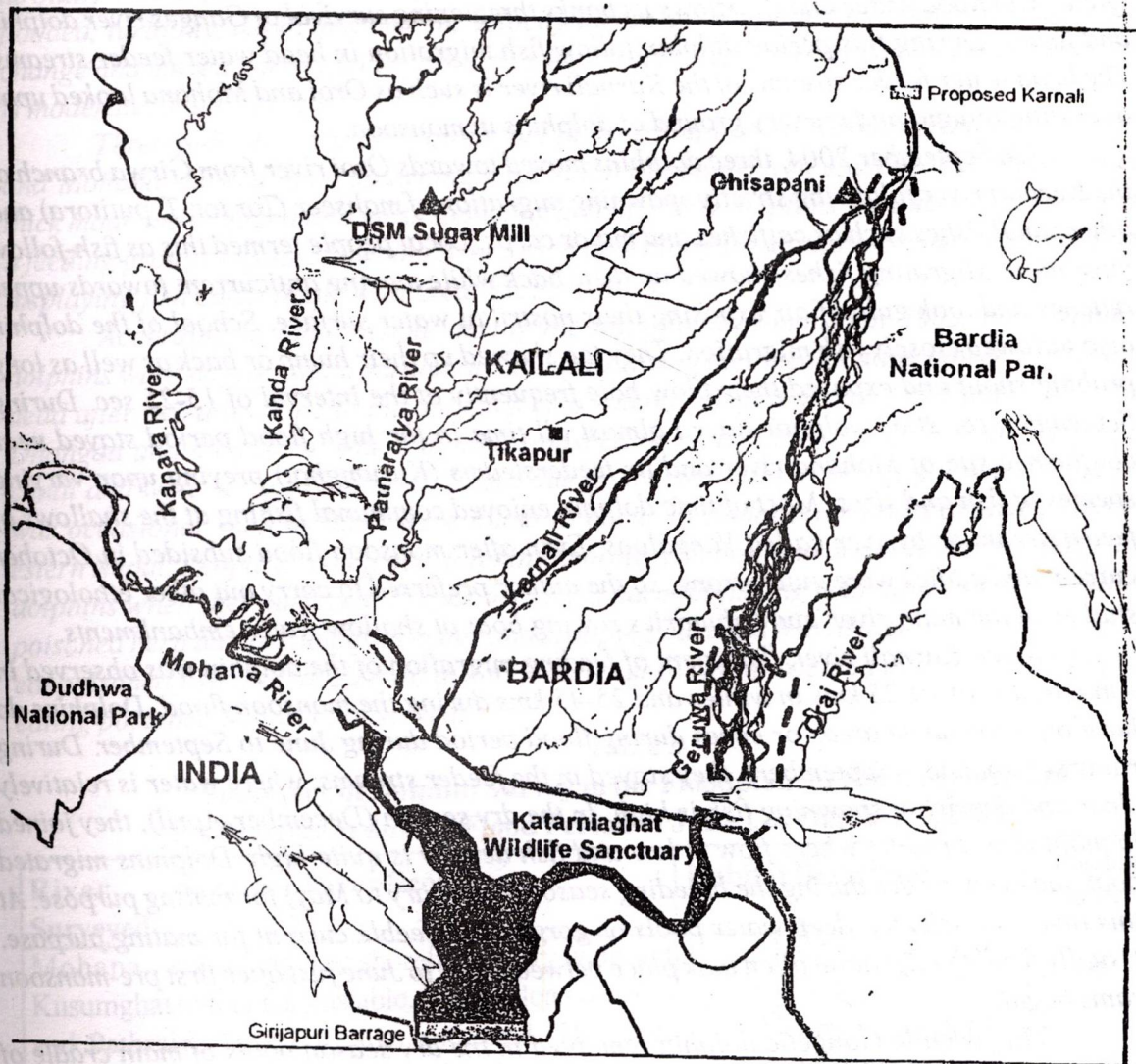
The Ganges dolphins did not permanently inhabit a particular area or pools of the Karnali river. They constantly moved upstream and downstream of the river for feeding and breeding which result in the changes in their number in a river. They were seen near Grewa and Oroï river confluence where densities of fish are quite high. The marked seasonal changes in dolphin distribution and density over much of the Nepalese rivers are due, at least in large part, to fluctuation in water levels, current velocity and turbidity. For example, during the low water phase of the dry season from October to April, many dolphins leave the feeder streams of the Karnali river systems (Mohana and Patheriya) and congregate in the main so called Kauralia channel of the Karnali river, and they return again to tributaries the following rainy season. However, some individuals, mainly young ones (calf) remained in the tributaries throughout the dry season and wait there for meeting migratory adults next year. The seasonal movement of the Ganges river dolphin were observed in the Mohana river (a feeder stream of the Karnali river) and its feeder streams. Most observations were made in the Karnali and Mohana river confluence at Chaugurdighat, Mohana and Pathaiya confluence sites. Most dolphins were migrating from the main branch of the Karnali river to feederstreams for food,

Figure 1



3. Hydrograph of the Karnali River Showing Fish Prey and Dolphin Movement

Figure 2



shelter, rearing and growing young ones. They returned to main river (Karnali) soon after the flood subsided in tributaries. (Table 2 and 3)

Record of Episode of Dolphin Migration

During monsoon period June to September, the major river system such as Karnali swells with flood water and overflows its banks threatening survival of Ganges river dolphin and fishes. During this period dolphin follow fish migration in head water feeder streams. The head water feeder streams of the Karnali river is such as Oroi and Mohana looked upon as resting refugia and nursery ground of dolphins in monsoon.

*On September 2004, three dolphins moved towards Oroi river from Girwa branch of the Karnali river following strictly spawning migration of mahseer (*Tor tor*, *T. putitora*) and other small fishes such as catfishes and major carps. Local people termed this as fish-follow migration. Migrating fishes showed up their back while moving anticurrent towards upper reaches and took gulp of air exposing their nostril at water surface. School of the dolphin also followed closely fish migration. They too showed up their hump or back as well as long probing snout and exposed their blow hole frequently at the interval of 15-25 sec. During September 18, 2003 dolphin stayed almost all time in the high flood period stayed near confluence site of Mohana river and its feederstreams (Kusumghat) preying upon varying species of fish and sizes. Most of time dolphin enjoyed communal fishing at the shallows of feederstream or byriver called Vangaloos. Even after monsoon flood subsided in October current and eddies were quite strong, so the author preferred to carry out other ethological studies in the main river and tributaries rowing boat at shallow water embankments.*

In the Karnali river, the extent of feeding migration of the dolphin was observed in a magnitude of 10-25 kms in winter and 25-45 kms during the monsoon flood. Dolphins do have their favourite areas or coves during flood period during June to September. During rainy season (June-September), they stayed in the feeder streams, where water is relatively clear and density of spawning fish is high. In the dry season (December-April), they joined in main river craddle where flow is low and fish density is quite high. Dolphins migrated pool and deep gorges during the breeding season (February to May) for mating purpose. At this time they selected deep water pools or gorges with feeble current for mating purpose. Usually feeding migration often took place between May to June just after first pre-monsoon rains begun.

The juvenile Gangetic dolphin remained in the dry season pools of main cradle of Karnali river from October to April. This time ichthyomas mass was stable, remained concentrated in deep pool of the Karnali river, they spent much time hunting, chasing the fish. Females gave birth of young by April and May coincide first rains. As soon as pre-monsoon rain started in June water become turbid, breeding ichthyomass got dispersed and dolphin migrated towards feeder streams. Dolphin with their calves also migrate upriver, they engaged themselves in hunting and chasing diverse species of breeding fishes.

In one incident Sept 10, 2003, 12 dolphins (8 adult and 4 juveniles) were encountered in between confluence site of Patharia and Mohana river. These two rivers are the feeder

streams or tributaries of the Karnali river. Most of the dolphin encountered were young distinguished by their greyish brown skin, they were surfacing frequently than their parents.

It was found that migration of dolphin was triggered by changes in water volume, turbidity and explosive spawning migration of fishes. As main craddle of river become flooded, turbidity, depth and current velocity increased, dolphin could not withstand such change and moved upriver feeder streams where water clear, oxygenated and water velocity is moderate, depth is ideal.

Three year observation showed that in the tributaries of Karnali river such as Oroi and Mohana showed good spawning population of fish arrived each year. They swam as thick moat and engaged into mass spawning activity. Here dolphins were seen assembling in a feeding group chasing spawning fishes each time along the shallows sometimes were seen displaying fish catch in air with great excitement.

According to local people during the high flood of monsoon 2003, two stranded dolphins were seen at Chaurgurdighat but due to losing their ecolocating power were found dead after two days. One of the dolphins also entered irrigation canal of Gauri Nala near Dhangad and died there. These dolphins dashed or rushed into the wall of the irrigation canal and were seriously injured. Death due to accidental by-catch in gill net fishing net was occasional such incident were found to occur in Babai river and Lohandra river of estern Nepal. People also enjoyed dolphin shooting with bow and arrow and guns , targeting dolphins when they surfaced. People also tried harmful fishing techniques such as spilling poisoned herb and pesticides in water and scooping out dead fish. Dolphin also happened to eat poisoned fish (half dead fish) due to insecticides . No intoxicated and poisoned dolphin eating poisoned fish were observed.

Table 2

Summary of Dolphin Survey in the Floodplain of Karnali river and Feederstream during Flood Period of June 1 to October 1, 2004

River Surveyed	Section	River Ecology	Habitat Description	Dolphin Sighted
Mohana river at Kusumghat (Mohana and Pathraiya River confluence site)		The shoreline is very wide and unstable. The bed load consists of, silts and sand. The river swollen with turbid water about 300 m wide and 10-20m deep. Here 7 dolphins are regularly seen at this spot. Professional fishermen from Nepal and India ply their fishing boat and set their drift net and gill nets for fishing.	River bank is not easily approachable by boat. Strong current and ripples preclude navigation.. The pH of water varies from 6 to 9 and current velocity 3 to 5 m/sec. Water surface temperature 25 to 30 °C. Fish swarming takes places in the clear water confluence site of the so-called	4

	Dolphin are caught in fishing net at night.	Pathariya Khola and Mohana river. Dolphins were seen chasing spawning fishes rounding their fish catch along shallow bank. of the clear water of the Pathariya streams.	
Karnali river at the confluence with Mohana river near Chaugundighat	Grewa channel of the Karnali river is meandering. Creates many channels and oxbows making a summer resort for dolphin. River 200 to 300 m wide channels are seen there.	River bank is very much eroded and not shaded with trees. Many uprooted trees are seen in the river bank. The bank is unstable, exposed, bottom is covered with pebbles and fine sands. Drifting wood, leaves and twigs cover the bank. Wood cutters, shepherds and cow herders collect tree trunk and woody matter for firewood. Fishermen take best advantage of the situation. They catch juvenile dolphin in their gill net. Adult dolphins are seen hunting and fishing motif occasionally entering oxbows and backwater of pools created by boulders. Many drift net fishermen capture ripe fish with running eggs in the feeder streams.	3

Girwa branch of Karnali river near Kothiaghat near Karnali Oroil confluence.	Floodplain of the Grewa branch of the Karnai river has sandy bottom. The river is about 150 to 300 m wide in flooded condition. Here Karnali river carves out numerous criss-crossing channels	The river water is laden with high silt load. The river bank unstable habitat is much disturbed. Water is so turbid that it appears half solid, half liquid. Drifting material consists of logs, wood, rhizomes, rooted vegetation. About 8 dolphins are occasionally seen. many gill net and drift net fisherman seen catching spawners by means of baited hooklines.	3
Kauriyala branch of the Karnali river at Rajapur	Karnali river is highly disturbed by human activity. The width and depth varies 300-500 m and 10-20 m. River is broken into number of sister channels. Many fishermen seen plying their boat near the bank, drift wood collectors are seen collecting uprooted trees, tree trunks, branches for fire-wood. Occasionally wildlife such as deers, blue bull, sambar, boars are seen washed away by flood. Situation in the river bank is cataclysmic.	River bank is sandy and muddy. River water contains a lot of organic matter rotten leaves, debris that suffocates fish and impair respiration. Fish kills were observed along river banks. Occasionally very young dolphins are seen stranded and lying helpless. The river is not navigable by boat due to strong eddies current, with high crest and ripples. Rescue operation is dangerous and not fruitful at all.	2
Total dolphins sighted			12

Table 3
Dolphin Sighted at Indian Frontier of the Karnali River

Karnali at Indian frontier between Katarniaghat Wildlife Sanctuary and Girijapuri Barrage	The Karnali river is highly disturbed by human activity. The river with spans of 400 to 650 m wide and 20-50m deep. Number of fishing boat plying near the bank, stone mining and rock mining is common.	Girijapuri barrage is low barrage without fish ladder. During monsoon flood period water level above and below the barrage shows no appreciable difference. Dolphins were seen crossing barrage with great difficulty. Only low water phase of winter barrage pose threat to migratory population. Burst of dolphin activity is seen early morning and at night. Highly turbid silt laden water affect dolphin swimming ability. They come near shallow bank near barrage. Dolphin are caught by fisherman gill net. Dolphins often seen stranded near barrage due to failure of echolocating power are later killed by fishermen at night.	20
Total dolphins sighted			20

June 1 to October 1, 2004

Table 4

Showing Food Preferences of Ganges Dolphin, during Explosive Fish Migration period of July

Common Name	Vernacular Name	Scientific Name	Food Preference Order
Minor carp	Sidra	<i>Puntius ticto</i>	++++
Minor carp	Sidra	<i>P. sarana</i>	+++++
Minor carp	Sidra	<i>P. sophore</i>	+++++
Mahseer	Sahar	<i>Tor tor</i>	+++++
Mahseer	Pahelo Sahar	<i>Tor putitora</i>	+++++
Minnow	Marod	<i>Aspidoparia morar</i>	++++
Stone roller	Mate Buduna	<i>Crossocheilus latius</i>	++++
Mud perch	Dalahi	<i>Nandus nandus</i>	++++
Murrel	Charangi	<i>Channa punctatus</i>	+++++
Murrel	Charangi	<i>C. gachua</i>	+++++
Garfish	Kauwa	<i>Xenentodon cancila</i>	+++++
Perch	Chaner bijuwa	<i>Ambassis nama</i>	+++++
Spiny eel	Bam	<i>Macrogathus aculeata</i>	++++
Goby	Lata	<i>Glossogobius giuris</i>	+++
Carp-minnow	Galara	<i>Barilius bendelsis</i>	+++
Carp-minnow	Namshera	<i>Chela labuca</i>	+++
Carp-minnow	Namshera	<i>Salmostoma phulo</i>	++
Carp-minnow	Pirawa	<i>Amblyphrynogodon mola</i>	++
Carp-minnow	Dedhawa	<i>Esomus danricus</i>	++
Medium carp	Gorahi	<i>Chagunius chagunio</i>	+++
Stone roller	Buduna	<i>Garra gotyla</i>	++++
Carp	Mrigal	<i>Cirrihinus mirgala</i>	+++
Carp	Kalonch	<i>Labeo calbasu</i>	++++
Carp	Rohu	<i>L. dero</i>	+++
Carp	Rohu	<i>L. gonius</i>	++
Shrimp	Jhingae	<i>Penaeus sp</i>	+++
Craab	Gangata	<i>Cancer sp.</i>	+++
Mollusc	Ghonghi	<i>Pila sp.</i>	++

• ++ least preferred, +++ less preferred, ++++ well preferred, +++++ highly preferred

Discussion and Conclusion

Although Anderson (1978), Pilleri (1976), Kasuya and Haque (1972), Shrestha (1992) made extensive study on distribution of dolphin in rivers, little is said about migration of dolphin population

to head water feeder stream. Present study reveal for the first time upriver yearly migratory cycle of dolphin with coinciding high water monsoon flood.

Several environmental factors are correlated with the onset of headwater or upriver migration of Ganges river dolphins (Shrestha, 2002). Water quality, water level, discharge, gustatory impulses temperature have been identified as the most important factors related to migration.

Anderson (1878), Pilleri (1976), Kasuya and Haque (1972), Shrestha (1995, 2004) made extensive study on distribution of dolphin in rivers, little is said about interstream migration of dolphin population. Present study reveal for the first time synchronization of upriver migratory cycle of dolphin with flood cycle of river and mobile breeding fish population in the main river and tributaries. Further, snowfed and rainfed water coupled with murky run off impart peculiar river odour that provide gustatory impulse to fish and dolphin for upriver migration.

Development of dam and irrigational canal provide new threat to migratory dolphins (Shrestha, 1995, 2001). They deflect normal course of migratory movement. Operation of novel types fine meshed nylon drift nets, electrofishing and dynamiting activities are equally fatal for dolphins survival. Fishing gears such as rolling hooks, cast net, drift nets pose threat to young dolphin having weak sonar capabilities.

The present investigation demonstrates positive relation correlation between rise of water volume unstable discharge of flood water and the number of upstreaming dolphin. Likewise fall of water volume and stable discharge shows downstream migrating tendency. Ganges river dolphin exhibit significant habitat shift through their lives during hydrological period of flood and draught. The breeding areas are mostly found in deep pools of main river Karnali. After the young is born in May and June river water quality changes due to seasonal rain so also temperature and current velocity. Dolphins begin upriver migration towards headwater tributary in June for search of better fish food and nursery for growing youngs. Although feeding condition improve considerably in the new environment of head water upriver tributaries and river confluence, but the change of the habitat condition is critical during their life cycle (Fig. 3).

- a) Spectacular Gangetic dolphin migration to head waters feeder stream of the Karnlai river were recorded with the coinciding event of fish migration for first time.
- b) Dolphin migration coincided prespawning migration of fish between June and August, dolphins migrated from Karnali river to tributaries (Mohana river) following spawning migration fishes. Dolphins spent about four months (June-September) at the confluence of feeder streams or tributaries hunting and chasing spawning fishes.
- c) During the wet hydroperiod of monsoon (August-September) adult dolphins and young dolphins remained in feeding ground of small tributaries rearing their new born calves and training them fish hunting.
- d) Knowledge of migration and dispersal of dolphin in tributaries will contribute greatly to development of more biologically realistic dolphin conservation strategy related to fishery strategy and action oriented.
- f) High turbidity due to seasonal monsoon provide stimulus for upriver migration of dolphin.

Management Consideration

Life cycle of Ganges river dolphin revolves round clear water feeder stream and turbid water principal river. The confluence site of the headwater feeder streams feeding main river

Karnali serve as refugia for migratory dolphin population in the monsoon flood period. Beyond this general understanding however, detailed information on utilization of such headwater feeder streams by dolphin and spawning migration of fish is limited. This paper describes monsoonal movement of the Ganges river dolphin towards headwater tributaries of the Karnali river. The present paper also highlights need of regulation for opening and closing of existing flood gates (sluice gate) of barrages in Nepal-India border to facilitate migratory dolphin and fish population to headwater and fulfill their feeding and reproductive urge. For this purpose spillway and other tailwater of barrages should be protected for migratory population and fishing should be prohibited there and around. The author shows clearly that population of the dolphin exhibit distinct specific behaviour patterns that persist at seasonal scale and are related to the changes in water level, velocity and migration of fish school during monsoon.

Acknowledgment

I am thankful to Dr. Govind Prashad Sharma, Vice-chancellor of Tribhuvan University for his interest in dolphin research. I am thankful to research division of Tribhuvan University for help and support.

References

- Anderson, J. 1878. Anatomical and zoological researches: comprising an Account of the Zoological Results of two expeditions to western Yunnan in 1868 and 1875 and a monograph of the two cetacean genera *Platanista* and *Orcella*. 2 Vols. B. Quaritch, London.
- Kasuaya, T. and Aminul Haque, A.K.M. 1972. Some information on distribution and seasonal movement of the Ganges dolphin and seasonal movement of the Ganges dolphin. Sci. Rep. Whales Res. Inst. 24: 109-115, pls. 1-3.
- Pilleri, G. 1970. Observations on the behaviour of *Platanista gangetica* in the Indus and Brahmaputra rivers. Investigations on Cetacea 2, 27-60.
- Shrestha, T.K. 1983. Determining status of dolphin and crocodile in the Karnali river of Nepal. National Council of Science and Technology (Unpublished Report).
- Shrestha, T.K. 1986. Ecology of Gangetic Dolphin *Platanista gangetica* in Karnali river of Nepal. In: Nepal Himalaya Geo-ecological Perspective, Dr. S.C. Joshi *et. al.* (ed.). pp 111-142.
- Shrestha, T.K. 1995. The Ganges River Dolphin. A Study of the Wilderness and Biodiversity of the Himalayan waters of Nepal. B. Shrestha, Kathmandu. p. 242+169 plates
- Shrestha, T.K.I. 2001. Endangered Dolphins. Shangrila, January-March Issue. Royal Nepal Airlines.
- Shrestha, T.K. 2002. Conserving Gangetic dolphin in Nepal. King Mahendra Trust for Nature Conservation. Vol. 5:2, pp 2-3.
- Shrestha, T.K. 2004. Migration of Ganges river dolphin in the Koshi river and its tributaries. Cheetal 42(1-2): 9-18

Maternal behaviour in Hanuman langurs, *Semnopithecus entellus* around Jodhpur

*L.S. Rajpurohit, Gautam Sharma and Bharti Sharma

Introduction

Maternal behaviour is a complex series of interactions between the adult female and the young infant. It is a well integrated system of behaviour patterns adapted to the efficient protection and nourishment of the dependent young langur. In many respects, the behaviour of langur mother is very similar to mothers in other species of monkey. Females with small infants usually gather in groups and stay in the most protected area of the troop, in or near its center surrounded by the rest of the group members. Normally, when a langur mother is holding a small infant, she avoids adult males and does not take part in the grooming of an adult male.

Protection and care taken by mother to their offspring for successful continuation of race is known as "maternal behaviour". Most mothers in free ranging troops are good mothers, but some are not. The adult life of female in all species of monkeys is focused primarily on the care and nurture of young ones, and the langur is no exception. In Hanuman langurs (*Semnopithecus entellus* Dufresne, 1797) the female usually gives birth to a single infant, but twin births are not uncommon. The newborn langur clings to the mother's belly and retains grip even when she is running, jumping or climbing trees. It clings to the mother's body with a nipple in its mouth. If the mother holds it away from her body for inspection or grooming, the infant appears to be very uncomfortable and squeals loudly. A two week old infant recognizes its mother from other adult females from a distance of 4-5m. By one month it moves freely within 1-2 m of the mother, and by 3 months the infant starts taking some solid food by sampling plants which the mother eats, picking up pieces of food which she drops and taking small bits from her hands and mouth. By 5 months the infant is able to run about 10-12m from the mother. By 6 months or so the infant spends several hours each day playing with other infants. And when they are 8-9 months, play becomes more pronounced.

A female's dominance relations with other adults are suspended temporarily when she has a newborn infant. A mother avoids dominance interaction and is outside of the female dominance hierarchy as long as she is with the infant (Jay, 1962).

Study Animal

The Hanuman langur (*Semnopithecus entellus*) is the most adaptable and widespread south Asian colobine of the Indian subcontinent. The species has been the subject of investigation because of its unique behaviour pattern including infanticide (Sugiyama, 1965; Mohnot, 1971a; Hrdy, 1974; Roonwal and Mohnot, 1977; Makwana, 1979; Sommer and Mohnot, 1985; Agoramoorthy and Mohnot, 1988; Rajpurohit et. al. 2003).

Key word: *Semnopithecus entellus*, new born infant, maternal behaviors, weaning, Jodhpur

*Animal Behaviour Unit, Department of Zoology, J.N.V. University, Jodhpur

These langurs live in a wide range of habitats from the Himalayas (v 3600m) and peninsular forests to semiarid woodlands, in villages and towns and in cultivated lands (Roonwal and Mohnot, 1977; Vogel, 1977). These animals are known for their remarkable adaptability, the species also has a highly variable social organization. The two basic types of social groups are bisexual troops and all-male bands. Troops are matrilineal groups of adult females and offsprings with either one adult male (unimale bisexual troop or harems) or more than one adult male (multi-male troops).

Study area and material- methods

Jodhpur is located in western Rajasthan (altitude about 241 m, Latitude $26^{\circ}18' N$ and longitude $73^{\circ} 08 E$) at the eastern edge of the Great Indian Desert. The town was erected on a hilly sandstone plateau of approximately 150 kms² surrounded by flat semi-desert. This diagonal plateau is inhabited by a geographically isolated pocket population of 1850-1900 langurs (Mohnot, et al, 2001; Rajpurohit et. al. 2006), which has been studied by various Indian and German researchers for more than 40 years now.

The animal *Semnopithecus entellus* are easy to observe since they are not shy and spend most of the daytime on the ground (Mohnot, 1974; Sommer, 1985; Winker, 1988; Rajpurohit, 1987; Rajpurohit et al., 1994). Langur exhibit clear-cut sexual dimorphism an average adult male weight 18.5 kg and female weighs 12.5 kg (Sommer, 1985).

The number of bisexual troop varied between 28 and 30 (c.f. Mohnot, 1971a; Rajpurohit, 1987; Rajpurohit & Sommer, 1991). The mean troop size is 38.5 members (range 7-120 members). The number of all male band is about 13; averaging 11.8 member (range 2-47 members). All male bands invade home range of bisexual troops is an unpredictable pattern, some time resulting in rapid or gradual replacement of the resident male (Rajpurohit et al., 2003). Recent population survey of an isolated pocket population of Hanuman langur (*Semnopithecus entellus*) around Jodhpur (Rajasthan) during April-May, 2006 revealed that there are total 1869 animals counted (Rajpurohit et. al. 2007).

Scientific research on ecology and sociobiology of langurs in Jodhpur has been going on over last 40 years and an enormous amount of information has been published and recognized internationally (Mohnot, 1971, 1974; Mohnot.al, 1981, 1987; Winkler, 1981; Sommer, 1985; Agoromoorthy, 1987; Rajpurohit, 1987; Rajpurohit, & Sommer, 1991; Rajpurohit et. al. 1994, 1995; Srivastava, 1989; Borries, 1989; Bhaker, 2001; Rajpurohit et. al. 2006 and 2007).

The climate is dry, with maximum temperature about $48^{\circ} C$ in May/ June and minimum around 0° in December / January. Jodhpur used to receive its 90 % scanty rainfall (average 360 mm) during the monsoon from July to September. The natural open scrub vegetation is dominated by xerophytic plants including *Prosopis juliflora*, *P. cineraria*, *Acacia Senegal*, *Calotropis procera*, *Caparis deciduas*, and *Euphorbia caducifolia*. Water is available to all langur groups.

There are numerous irrigated park and fields. The langurs feed upon about 200 natural and cultivated plants species. For religious reasons local people provided most of the groups here with wheat preparations, vegetables, fruits, nuts and even sweets. Some groups raid crops, but

they are considered to be sacred and are never hunted (chasing by farmer/gardeners from their fields or park generally observed). Apart from feral dogs, there are no reports of natural predation. However, hyena, wolves and jackals can be seen in this region. For collection of data, the focal animal samplings, scans and *ad libitum* samplings were used (Altman, 1974). To identify the known individuals a powerful binocular and to have photographic evidences of different behaviours/incidents a canon camera was used. For collection of data the focal animal sampling, scans and *ad libitum* sampling were used (Altman, 1974).

Observation and Result

The primary concern of a mother is her infant and its safety, regardless of where she is or which other female is holding her infant. There is a great variation among mothers in the care of their infants and among females when they are holding the infants of other females. Not all mothers or females are equally adapt or efficient when handling a newborn infant. That is, not all females can keep the infant quiet and content. A few female are awkward and clumsy in their attempts to support an infant in their arms, but the majority of females have little or no trouble.

(1) Infant –allomother interaction

During the first month of life the infant is carried transversely on the back of its mother, then longitudinally thereafter. Mothers and siblings frequently interact with infants during the first 6 months of life and it is termed the 'kin phase'. Aside from the mother, siblings are the most important social partners during the 'kin phase'. Allomothering is common in Hanuman langurs. 'Allomothering' means when any other relative female or troop members take the infant from mother and try to care as a caretaker. It shows negative behaviour of relationship between infants and their mothers in non-human primates. In other words it is negligence of mother towards infants. The severity of ignorance also depends on the age and experience of the mothers.

(2) Mother-Infant relation (in case of twin birth)

It is known that multiple births do occasionally occur in various catarrhine species. In Jodhpur also there were some cases observed in Hanuman langurs which have twins birth and triplet birth. In multipal birth females could well manage to nurse two or three infants at a time. But some time in case of triplet birth it is difficult for the mother. Another possible limiting factor "preda-tion" is also nearly negligible in Jodhpur. But one can imagine that a mother of twins or at least the two babies would have less chance in the presence of a predator. The absence of predators, a sufficient supply of food, and the colobine system of allomother-ing seem to be good preconditions for successful rearing of twins and triplets in Jodhpur langurs.

(3) Mother-infant relation at weaning phase

'Weaning' means stop or leave suckling, which is a transition phase of the dyadic relationship between infants and their mothers in non-human primates. It is an important phenomenon in the life of mammalian species, where infants become independent to enter the next phase, the juvenile, and eventually the adulthood. In the process, their mothers may bear their next offspring rather efficiently.

In Hanuman langurs weaning starts between 7.5 to 10 months of age, average 8.4 months. The process is over after the duration of about 4 to 5 months period. And 13 to 15 months old infant is fully weaned. Male infants are weaned earlier compared to females. And male infants react to their mother's rejection more fearlessly and are more vocal. In this kind of mother- infant conflict during weaning the mother bites them at limbs, shoulders, or back. But the bites of mothers are neither severe nor meant to hurt their infants

(4) Mother-Infant relation in case of dead infant

The behaviour of mother with their dead infants has been observed from the day observer encountered a female carrying a dead infant. the dead infant's mother managed to walk on three limbs. At the feeding time the mother keep the dead infant on the ground and picked it up again. In the first 2- 3 days the mother treated the dead infant very carefully. She watches the eyes and the face of dead infant again and again. Some times she groomed and kissed the corpse of the infant. Jay (1962) suggests that three important elements viz. coat colour, vocalization and quality of movements in the infant's appearance and behaviour are essential in releasing maternal behaviour of the mother or of another adult females in langurs, thus the body of a dead infant may continue to elicit maternal behaviour from its mother (such as carrying, grooming) and other adult females for several days after death occurs. The carrying of dead infants reported for several primate species in the wild by Van Lawick-Goodall (1967) in chimpanzee, Schaller (1963) in gorilla, DeVore (1963) in savannah baboon, Kummer (1968) in hamadryas baboon, Prakash (1962) and Alley (1980) in rhesus macaque, Rahman & Parthasarathy (1969) in bonnet macaque,

Discussion

The newborn infant is not completely helpless, even at birth; it is a clinging vocal animal. Unlike the helpless human infant, the newborn monkey is able to cling without assistance within a short time after birth. Mother-infant relations are interaction involving activity and stimuli given by both the mother and infant, which release specific pattern of behaviour. Maternal behaviour in response to an infant is a two-way interaction. The roles played by infant, which release or stimulate protective, affectional, and nourishing behaviour, are extremely important, although much less is known about them than about the physiological and behaviour basis of maternal reactions.

The young of many mammalian species provide a variety of stimuli which influence vital parental responses. Bell & Harfer (1977) reveal that primate and other mammalian young "must

emit the appropriate cues and possess the necessary response capabilities to insure that care giving is released and is functional". Ethologists and comparative psychologists have long recognized that proper care of dependent young requires that parent--offspring interactions be regulated by reciprocally exchanged signals, and it is becoming increasingly clear that both parent and young are endogenously tuned to detect and react to each other's signals. In neonate mammals, behaviour is typified from birth by reciprocal simulative relationships between parents and young, whereby the neonate attracts the female, and the female presents a variety of primarily approach-inducing stimuli (Schneirla & Rosenblatt, 1961). Alley (1980) states that the distinctive markings and colouration found in young infants of many primate species function as signals which tend to "release" care giving responses. Jay (1962) suggests that three important elements viz. coat colour, vocalization and quality of movements in the infant's appearance and behaviour are essential in releasing maternal behaviour of the mother or of another adult females in langurs, thus the body of a dead infant may continue to elicit maternal behaviour from its mother (such as carrying, grooming) and other adult females for several days after death occurs.

The carrying of dead infants by mother reported for several primate species in the wild by Van Lawick-Goodall (1967) in chimpanzee, Schaller (1963) in gorilla, DeVore (1963) in savannah baboon, Kummer (1968) in hamadryas baboon, Prakash (1962) and Alley (1980) in rhesus macaque, Rahman & Parthasarathy (1969) in bonnet macaque, Merz (1978) and Paul (pers.comm.) in barbary macaque, Bowden *et al.* (1967), Clewe (1969) and Kaplan (1972) in squirrel monkey and Jay (1962, 1963), Mohnot (1974, 1977), Hrdy (1976), Rajpurohit (1987 & 1997), Rajpurohit and Sharma (2007), Winkler, Sommer, Bornes and Paul (pers. comm.) in Hanuman langur.

Jay (1962) in the langur *Presbytis entellus*, Prakash (1962) in the rhesus monkey *Macaca mulatta*, observed mothers carrying the dead infants. Koford stated that the corpse continued to be carried even after it had decayed, though the keeping period was not mentioned. Hanuman langurs at Jodhpur were also observed carried by their mothers or allomother (Agoramoorthy and Mohnot, 1988; Rajpurohit, 1987; Sommer, 1987).

The large number of data gathered on social behaviour and the ecologies of this species around Jodhpur. Mohnot (1974), Winkler *et al.*, (1984) and Borries (1989) have provided data on mother-infant relations, infant-development and grand-mother infant relations. Rajpurohit (1987) and Rajpurohit & Mohnot (1991) highlighted on the weaning process in langurs here. Mohnot (1974), Roonwal and Mohnot (1977) and Sugiyama (1965) found that weaning in common langurs occurs when the infant is about 11-15 months old and this period is of stress to the infant. 'Weaning' means stop or leave suckling, which is a transition phase of the dyadic relationship between infants and their mothers in non-human primates. It is an important phenomenon in the life of mammalian species. Maternal style in early infancy is reflected by how contact and proximity are regulated and how much contact the infant is allowed with others. In some primate species, none may touch the newborn for many weeks. In contrast, colobus and langur mothers may allow other members to carry away their new borns.

Acknowledgement

The authors are grateful to S.M. Mohnot Emeritus Professor of Zoology and chairman, Primate Research Center, Jodhpur for continuous encouragement. To dr. G.R. Jakher, and Dr. Rajiv Gupta Head, Department of Zoology, J.N.V. University, Jodhpur for providing facilities and logistic support during this study. Thanks are due to UGC, New Delhi for financial support under major project (No. F.30-200/2004 (SR) dt.10 Nov 2004). Thanks to AKC has CSIR-RAship, Devilal has JRF- UGCship and PV has CSIR- JRF.

References

- Agoramoorthy, G. 1987. Reproductive behaviour in Hanuman langur, *Presbytis entellus*. Ph.D. Thesis. University of Jodhpur, Jodhpur, India.
- Agoramoorthy, G. and Mohnot, S.M (1988). Infanticide and juvenilities in Hanuman langur (*Presbytis entellus*) around Jodhpur, India. *Hum. Evol.* 3: 279-296.
- Altmann, J., (1974). Observational study of behaviour: sampling methods. *Behaviour*, 49: 227-267.
- Alley, T.R. (1980). Infantile coloration as an elicitor of caretaking behaviour in Old World primates. *Primates*; 21 (3): 416-429.
- Bhaker, N.R. (2001). Role of vocal communication in sociobiology of Hanuman langur, *Semnopithecus entellus entellus* around Jodhpur (India). Ph.D thesis. J.N.V. University, Jodhpur.
- Bell, R.Q. and L.V. Harfer: (1977). Child Effect on Adults Lawrence Erlbaum Associates, Hillsdale. N. J.
- Bowden, D.P. and D. Ploog. (1967). Pregnancy and delivery behaviour in the squirrel monkey (*Saimiri sciureus*). *Folia Primat.* 5: 1-42.
- Borries, C. (1989). Konkurrenz unter freilebenden Langurenweibchen (*Presbytis entellus*). Dissertation, Gottingen, Gerorg-August Universitat.
- Clewe, T.H. (1969). Observation on reproduction of squirrel monkeys in captivity. *J. Repr. Fert. Suppl.*; 6: 151-156.

- Devore, I. (1963). Mother-infant relations in free ranging baboons. In: Maternal Behavior, in: Mammals, H.L. Rhiengold (ed.), Wiley; New York; pp. 305-335.
- Dufresne, P. 1797. Sur une nouvelle espece de singe, park. Dufresne (Description d'une nouvelle spece de guenon, sous le nom d' antelle). Bulleten de societies d' philo mathique (Paris) 1(7): 49.
- Hrdy, S.B. 1974. Male-male competition and infanticide among the langurs (*Presbytis entellus*) of Abu, Rajasthan. Folia Primatol, 22: 19-58.
- Hrdy, S.B. (1976). Care and exploitation of nonhuman primate infants by conspecifics other than the mother. In: *Advances in the Study of Behavior*; J.S. Rosenblatt, R.A. Hinde, E. Shaw & C. Beer (eds.), Academic Press New York pp. 101-158.
- Jay, P.C. (1962). Aspects of maternal behaviour among langurs. Ann. New York. Acad. Of Sci., 102: 468-476.
- Jay, P.C. 1963. The social behaviour of the langur monkey. Ph.D. thesis, University of Chicago, Illinois.
- Kaplan, J. (1972). Differences in the mother-infant relations of squirrel monkeys housed in social and restricted environments. *Develop. Psychobiol.* 5: 43-52.
- Kummar, H. 1968. Social organization of hamadryas baboons. Chicago: University of Chicago Press.
- Makwana, S.C. (1979). Infanticide and social change in two groups of the Hanuman langur, *Presbytis entellus* at Jodhpur, Primates, 20: 293- 300.
- Merz, E. (1978). Male-male interactions with dead infants in *Macaca sylvanus*. *Primats*. 19 (4):749-754.
- Mohnot, S.M. (1971a). Some aspects of social changes and infant killing in the Hanuman langur, *Presbytis entellus entellus* (Primates: cercopithecidae) in Western India. Mammalia, 35: 175-198.

Mohnot, S.M. (1974). Ecology and Behaviour of the common Indian langur, *Presbytis entellus*. Unpublished Ph.D. Thesis, University of Jodhpur, Jodhpur.

Mohnot, S.M. (1977). : Observations and Behaviour of the common Indian Langur, *Presbytis entellus* in India; In : The Natural Resources of Rajasthan, M.L. Roonwal (ed.) Univ. of Jodhpur, Jodhpur, pp. 499-503.

Mohnot, S.M; Gadgil, M. and Makwana, S.C. (1981). The dynamics of the Hanuman Langur population of Jodhpur, Rajasthan, India. Primates, 22: 182-191.

Mohnot, S.M., Agoromoorthy, G., Rajpurohit, L.S. and Srivastava, A. (1987). Ecobehavioural Studies Of Hanuman Langur, Presbytis entellus. Technical Report (1983-86) pp. IV +89. Mab Project, Department Of Environment, Govt. of India, New Delhi (p. ix + 87).

Mohnot, S.M. and Rajpurohit, L.S. (2001). Final Technical Report-Indo-US Primate Project (1994-2001), USFWS, USA and DOE & F, Govt. of India.

Prakash, I. 1962. Group organization, sexual behaviour and breeding season of certain Indian monkeys. Jap. J. Ecol., 12: 83-86.

Rahman, H. and M.D. Parthasarathy: (1969). Studies on the social behaviour of bonnet monkeys. Primates; 10: 149-162.

Rajpurohit, L.S. (1987). Male social organisation in Hanuman langur, *Presbytis entellus*. Ph.D. Thesis, University of Jodhpur, Jodhpur.

Rajpurohit, L.S., Sommer, V. (1991). Sex differences in mortality among Langurs (*Presbytis entellus*) of Jodhpur, Rajasthan. Folia Primatol, 56: 17-27

Rajpurohit, L.S. and Mohnot, S.M. (1991). The Process of Weaning in Hanuman langur, *Presbytis entellus*. Primates, 32(2): 213-218.

Rajpurohit, L.S., Srivastava, A. and Mohnot, S.M. (1994). Birth dynamics in Hanuman langurs, *Presbytis entellus* of Jodhpur, India, J. Bios, 19(3): 315-324.

- Rajpurohit, L.S.; Sommer, V. and Mohnot, S.M. (1995) Wanderer between harem and bands: Males of Hanuman langur *Presbytis entellus* at Jodhpur (Rajasthan, India). Behaviour, 132: 255-299.
- Rajpurohit, L.S. (1997). Why do mothers carry the corpses of their infants in Hanuman langur (*Presbytis entellus*) J. NATCON, 9 (2): 26 - 30.
- Rajpurohit, L.S., Chhangani, A.K. Rajpurohit, R.S. and Mohnot, S.M. (2003). Observation of sudden replacement of the resident male in a unimale Bisexual troop of Hanuman langur, *Semnopithecus entellus* around Jodhpur, India. Folia Primatol, 74. 85-87.
- Rajpurohit, L.S; Chhangani, A.K. and. Mohnot, S.M.; (2006) Population dynamics of Hanuman langur, *Semnopithecus entellus* around Jodhpur (India) during 1995-2001). PROC. NAT. ACAD. SCI. INDIA, Vol. 76 (B), II: 141-147.
- Rajpurohit, Lal Singh and Gautam sharma (2007). Observation on multi male Bisexual troop of Hanuman langurs, *Semnopithecus entellus* around Jodhpur, Rajasthan. Proceeding of 94th Indian Sci. Congress to be held at Chidambaram (Tamil Nadu) in (3-7 January) 2007 (P.85).
- Rajpurohit, L.S.; Sharma, G; Chhangani, A.K.; Rajpurohit, R.S.; Bhaker, N.R.; Rajpurohit, D.S.; Vijay, Prateek and Devlal (2007). Study on the Demography Structure in Free-ranging Hanuman langurs, *Semnopithecus entellus* around Jodhpur (Rajasthan). Proceeding of for 94th Indian Sci. Congress held at Chidambaram (Tamil Nadu) in January, 2007 (P.85).
- Roonwal, M.L. & Mohnot, S.M. (1977). Primates of South Asia, Harvard University Press, Cambridge, Mass.
- Schaller, G.B. (1963). The Mountain Gorilla. The University of Chicago Press, Chicago
- Schneirla, T.C. and J .S. Rosenblatt , (1961). Behavioural organization and genesis of the social bond in insects and mammals. Am. J. Orthopsychiat., 31: 223-253.
- Srivastava, A. (1989). Feeding ecology and behaviour of Hanuman langur, *Presbytis entellus*. Ph.D. thesis, University of Jodhpur, Jodhpur .

- Sommer, V. and Mohnot, S.M. (1985). New observations on infanticide among Hanuman langur (*Presbytis entellus*) near Jodhpur (Rajasthan, India). Beh. Ecol. Sociobiol. 16: 245-448.
- Sommer, V. (1985). Weibliche and mannliche Reproduktion strategien der Hanuman langurren (*Presbytis entellus*) von Jodhpur, Rajasthan/ India, Ph.D. thesis, University, of Gottingen, Gottingen.
- Sommer, V. (1987). Infanticide among free-ranging langurs (*Presbytis entellus*) at Jodhpur, (Raj. India): Recent observations and reconsideration of hypothesis. *Primates*, 28: 163-197.
- Sugiyama, Y. (1965). On the social change of Hanuman langurs (*Presbytis entellus*) in their natural conditions. Primates, 6: 381-417.
- Van Lawick-Goodall, I. (1967). Mother-offspring relationship in free-ranging chimpanzees. In: Primate *Ethology*, D. Morris (ed.), Weidenfeld and Nielson, London, pp. 287-346.
- Vogel, C. (1977). Ecology and sociobiology of *Presbytis entellus* In: Prasad, M.R.N. and Anand Kumar, T.C. (eds.). Use of Non – Hanuman Primates in Biomedical Research. India Nat. Sc. Acad. New Delhi, Pp. 24-45.
- Winkler, P. 1981. Zur oko-ethologie freilehender Hanuman languren (*Presbytis entellus entellus*) Dufresen, 1797) in Jodhpur (Rajasthan), Indien. Ph.D. thesis, Goettingen, George-August Universitat.
- Winkler, P., Loch, H. and Vogel, C. (1984). Life history of Hanuman langur (*Presbytis entellus*). Reproductive parameters, infant mortality and troop development. Folia Primatol., 43: 1-23.
- Winkler, P. (1988). Feeding behaviour of a food- enhanced troop of Hanuman langurs (*Presbytis entellus*) in Jodhpur, India. In: The Ecology and Behaviour of food-enhanced Primate Groups, J.E.Fa & C. SOUTH WICK (eds.), Alan R. Liss, Inc., New York, pp.3-24.

GOLDEN LANGUR: THREAT AND CONSERVATION

*J.P. Sati

Introduction

The Northeastern region of India has exceptional biogeographical interest and therefore shows the great biodiversity in general and animal diversity in particular. Of the known 15 species of primates from India, nine species are found in Assam and the Golden Langur (*Trachypithecus geei*) is one of them. The subtropical humid climate and semi deciduous rain forest provides suitable habitat to these primates.

For the first time the Golden Langur was reported by the great naturalist, E.P. Gee in the year 1955 as new Langur of golden colour from Assam-Bhutan border area of Goalpara district, Assam, India. Thereafter, Khajuria (Scientist of Zoological Survey of India) described it as a new species of Langur by giving its detailed morphological descriptions like, body shape and size, weight and length, colour and colouration and other important characters, such as dentition, skull, skeleton, etc. After a detailed investigation, the Golden Langur was placed in the proper systematic position of order Primates in the year 1956.

The body coat of the newly born infant is creamy white, which gradually changes in to bright golden during its adulthood, and gets name golden Langur because of its body coat. During the breeding season (winter), the coat colour changes into dull red. Other seasonal changes in their coat colour are also seen. Their skin colour is always black. The ill-defined half whorl of forehead and distal part of tail is much paler than other body parts.

General Habits and habitat

These Langurs inhabit in mixed deciduous to semi deciduous moist sal forest with some reverine and savannah forest. The major food trees as terminalia belerico, Bombax ceilia, Cedrela toona, Albizzia lebbok, Salmalia malabarica, Dalbergia sissoo, Acacia, Bauhina, Ficus sp. etc. They generally occupy middle to high canopy of the forest during foraging. Occasionally they are seen on the ground when the food is scarce. Just after awakening they start their day's activities like feeding, foraging, resting, exploring area for food and shelter. Once or twice in a day, they go to the water to quench their thirst. During the hot sunny days they rest under the thick foliage of the trees while during winter season they generally sun bath on the top branches of trees. Adults groom each other while young ones spend their time playing during resting time.

Distribution

In India, the Golden Langurs are confined to the foothills of Assam-Bhutan border in Jamdua-Raimona area in the Raimona forest range in Goalpara district of Assam between the rivers Sankosh and Manas rivers. Some populations have also been reported adjacent to the Manas Tiger Reserve.

Besides the Indian Territory, they are found in Royakl Manas National Park in Bhutan adjoining Goalpara district, Assam. The studies so far done on their distribution show that they are confined to the southern and central Bhutan and northwestern part of Assam bordering Bhutan. It shows that this species is restricted in its distribution to these areas only. In other words we can say that this is an endemic species to this area of Assam-Bhutan border. Till date it has not been reported outside this distributional range other than zoos or some translocation population in Tripura, India. During the recent past a New Delhi based newspaper "The Times of India" of 20th Nov. 1996 reported that some of the trekkers from Association for Protection of Environment and Endangered Species (APEES) reported that they have sighted these langurs in east garo hills, Meghalaya, south to river Brahmaputra in their natural range of distribution. The APEES members might have confused them with capped langurs as they also look like golden langurs in winters, when their body coat ranges from rusty red to golden in colour specially the under parts/portion of the body.

Group structure and group size

Like other langurs, they also have the social group organisation having the adult males and females, sub adult males and females, juveniles and infants in a group. Their group size varies from 5-20 individuals with a mean size varying from 9 to 12 individuals and the male and female ratio is reported to be 1:2.2 approx. Most of the groups are bisexual, only on few occasions the all male unisexual groups are seen. Most of the groups have a single adult dominating male. Their group size varies from 7-20 individuals.

Daily activities

Golden langurs are diurnal in habit and their activities are confined to light hours between dawns to dusk. Like other langurs their activity pattern is a routine affair, consisting of awakening, foraging, feeding, resting, sleeping etc. They generally wake up at dawn, and after that they move for feeding gradually, depending upon the weather condition. In the morning hours they were seen urinating, defecating, stretching and shaking their body. Generally the langurs have a well defined home range and they forage around their home range for food, water and shelter. In the mid day the group takes rest on the higher canopy under the foliage during the summer and on the exposed branches in the winter. The young ones usually spent their time in playing, while the adult members of the group take rest. Adults spent their time in grooming each other. During summer, they go to water resources to drink water. In the after noon they feed vigorously and in the evening they move to their roosting site. Generally, they go late for roosting.

Food and feeding

They are vegetarian in nature but are sometime seen feeding on the small insects and the leaf galls. Leaves, buds, flowers and fruits of the plants form their diet. The food item varies from season to season. They forage through out their territory in search of food and conflicts between

the neighbouring groups near the overlapping zone were seen occasionally. They start feeding just after becoming active after awakening. It was seen that the morning bouts of feeding were for longer duration as compared to evening. In the summer season once or twice they used to go to the water points to quench their thirst. Villagers of the area reported that they never saw them raiding their crops. Adults, sub-adults, juveniles and infants of more than one year of age were seen feeding on the plant stuff where as the new born infants observed feeding on the mother's breast. The major food plants on which they were seen feeding are *Terminalia belerica*, *Terminalia crenulata*, *Bombax ceilia*, *Cedrela toona*, *Lannea grandis*, *Albizia lebbek*, *Gmelina arborea*, *Salmalia malabarica*, *Dalbergia sissoo* *Amoora wallichii*, *Ficus benamina*, *Acacia* sp. etc. It is observed that they spend 35-40% time in feeding of their total activity period. As the infant grow older around 6 month of age, it starts feeding on the plant matter but during resting, it used to feed on milk.

Social Behaviour

In primates, social behaviour is one of the important behaviour, which plays the key roll of cohesiveness of the groups. Like other species of primates, the golden langur is also live in the social unit of male, females, sub-adults, juveniles and infants. Adults take part in propagation of future generation by mating during breeding seasons. The young ones are born, generally one at a time from a mated pair. The newly born infants are breast-fed until weaned from the mother. The mother from other group members and predators protects infants. Young ones spend most of their time playing where as the adults do grooming while resting in the sun during winter months and under the thick foliage of the trees in the summer. Grooming is seen between all the group members some or the other time in mutual manner. Adults do play at times when they are in the mood. Resting is common in the adults while playing in the main activity of their infants.

Breeding habits

Studies on their breeding habit show that they breed during winter as well as summer months. Scientists working on their behavioural aspects saw the new born infants in the months of May and June in summer and November to January in the winter. Usually a single infant is seen in the ventrum of the female, which means generally single infant is born at a time. The body coat of the new born infants varies from creamy white to pale in colour which gradually turns in to golden colour. The body coat is dull red in winters because of breeding season. The skin colour is black through out the life in all the sexes.

Population

In the early sixties, the estimate population of the golden langur was around 540 in an area of 600 sq.km. along Indo-Bhutan border. As the distribution of this species is limited and is endemic to the Indo-Bhutan border and their group composition varies from 5-20 individuals, their population

is also not very much. Though the major portion of their distribution range falls in the conservation area (Manas Tiger Reserve) which is a protected area, even then the habitat loss outside the reserve is alarming. Some section of local human population hunts it for meat besides highly arboreal clouded leopard and the python. Therefore, in the present time their population is gradually decreasing due to destruction in their habitat and the high anthropogenic pressure.

Threats

The following two major threats cause serious concern for their survival:

1. Large scale hunting for its meat.
2. Gradual destruction of their habitat.

Conservation measures

The Golden Langur, because of its exquisite beauty, grace and non-aggressive habits is a naturalist's delight. It can also make a good pet. Therefore, the conservation measures to protect them and their habitat should be taken on priority basis. Though the habitat of Golden Langur that falls within Manas Tiger Reserve is protected because of being part of the reserve and from legal/legislature point of view, it has been listed under schedule I of Wildlife (Protection) Act 1972. However, the threats for their survival are still at an alarming rate outside the protected areas because of gradual decrease in their habitat. Since this is an endemic species and the area of distribution is limited, the whole area should be protected in totality to save its habitat and population from further depletion. Local awareness and legal protection should be given to preserve and increase its population in its natural habitat. If it is not protected timely, the days are not far, to lose this lovely species of golden langur from its native habitat. Let us take some hard steps to protect the golden langur and its habitat.

Death of Young Hoolock Gibbons

The Hoolock Gibbon (*Hylobates hoolock*, Harlan) which is also known as the White-browed Gibbon, is dimorphic in coat colour and monogamous in nature. In India earlier they used to be found in good numbers throughout the northern eastern part of India. Due to developmental activities in the recent past, their habitat has shrunk badly and their population has also decreased drastically. Owing the threat of their survival, the species has been listed under Endangered (EN) category of Red List of Threatened Species by IUCN (2007). The species has been placed under Schedule I of Indian Wildlife (Protection) Act 1972 (Amended up to 2003) by the Government of India for its protection.

In a survey and census of the Hoolock Gibbons in the West Garo Hills district of Meghalaya, India, Alfred and Sati (1990) sighted 130 gibbons from 32 localities covering 812 km².

Recently in the month of March-April after a gap of nearly 20 years the same area of Garo Hills, Meghalaya, India proposed a survey to know the current status of those gibbons.

On March 25th 2007, while surveying one of the localities called Misimagiri, I came to know through the villagers that the two young gibbons died due to electric shock. During a conversation they said that, in the year of 1998 or so, when the electrification of the village came into operation the two young gibbons had an accident with naked electric lines, which pass through their territory. They further narrated that, during locomotion on these wires, the gibbons suddenly got an electric shock and were thrown down on the ground. The unconscious young gibbons were taken away by the village dogs. They also observed the adults growled throughout the day and were very much upset after this incident. Thereafter the adult pair was not seen in this territory.

This was a real shock to me because this was one of the three groups, which I studied extensively for their ecology and behaviour during the eighties. Even the villagers were expressing their feelings as they were closely associated with them many times.

Suggestion:

The environmental experts, planners and scientists working in this field should be consulted before proposing such projects in the remote localities where such type of wild life is found.

The electric lines which are being laid through the gibbon habitat should either be rubber coated or should be laid underground. As the gibbons are arboreal in habit and travel preferably by brachiating during locomotion, the exposed electric lines should be avoided through the forest patches. In case that is unavoidable the height of the lines should be increased so that it is beyond the reach of the gibbons. If the exposed lines are low in height and pass through the forest it may cause death of the gibbons again and again.

References:

Alfred, J.R.B. and Sati, J.P. 1990. Survey and Census of the Hoolock Gibbon in West Garo Hills, NE India. *Primates*. 31(2): 299-306.

IUCN 2007. 2007 IUCN Red List of Threatened Species. <<http://www.iunredlist.org/>>. Down December-2007.

The Wildlife (Protection) Act, 1972 (IWPA), As amended upto 2003. 2003. Wildlife Trust of India, New Delhi. Natraj Publishers, Dehradun Pp. 1-218.

Saving the Tiger

PM must keep his pledge

By Lt Gen (Retd.) Baljit Singh

Because it is there! That was the pithy response of George Mallory during a fund-raising lecture in Cambridge in 1924 when one in the audience asked: "Why climb the Everest?"

Elaborating further on the interrogative "why" to our quest for preserving the Royal Bengal Tiger species in the wilderness in India, let us not forget that first and foremost the tiger is India's national animal. And therefore it is one of the icons of our nationhood.

Now that the Government of India has conceded that we are left with less than 1,200 tigers the question which begs the answer is: how shall we save the species from imminent extinction?

Perhaps we can draw strength by recalling experiences from the last century where certain mammal and bird species were successfully provided a second lease of life, and draw lessons therefrom to mitigate the current tiger crisis facing us.

We have the case when in 1903 the eight Asiatic lions in the Gir forest constituted the only surviving pride of lions in the entire world. It was a common practice in colonial India for the rulers of the princely states to host the Viceroy over the Christmas week.

So the Nawab of Junagadh conceived the idea of tempting Lord Curzon with what would virtually be the last hunt in Asia for a lion trophy. Making departure with protocol, Lord Curzon replied in person to the Nawab. He declined his gracious invitation, inveigled with him to ban lion hunting altogether and protect the Gir forests so that the Asiatic lion may survive to perpetuity.

This provides us the finest example where the astute vision of the head of a Government coupled with an unwavering political will saved a mammal species from the very jaws of extinction.

Lord Curzon's successors and the Nawabs of Junagadh kept up the resolve so that on India's Independence in 1947 there were about 62 Asiatic lions in the Gir. Today they number more than 300!

Moving on to 1972 we arrive at the fateful year when the Arabian Oryx was declared extinct from the wild. And with that we come to the story where philanthropy of a handful petrodollar rich princes of the UAE has aided the reintroduction of this species.

Starting in the 1980s, in zealously guarded and regularly patrolled selected areas on the Arabian peninsula, where about 800 captively bred Arabian Oryx were released in trickle now and then, a new lease of life was provided to this species.

This is beginning of what may be the only initiative in the reintroduction of a species after total extinction. One crucial factor of success was that in Saudi Arabia alone a mind-boggling 2200 sq miles area for reintroduction was totally fenced-in which, without philanthropy, is simply unthinkable.

At this stage, it is essential for me to state emphatically that as of now, unfortunately, there has been very little success with reintroducing hand-reared or captively bred carnivore to the wild.

George and Joy Adamson, who left India in the 1940s to settle in S. Africa, tried to release in the wild their hand-reared, orphaned lion cubs.

These animals were either not canny enough or were wanting in physical vitality to stand up to their free-ranging members. The attempts failed to establish a precedence.

In India, "Billy" Arjun Singh, now an octogenarian, attempted to hand-rear a female tiger cub born in and purchased from the London zoo, with the idea of ultimately releasing it in the Dudhwa tiger reserve.

He fared better than the Adamsons in as much that Harriet did mate with a free ranging tiger, littered in the wild but brought the week-old cubs back, one by one to room in Tiger Haven, Billy's home on the fringes of Dudhwa!

The story beyond is marred in controversy whether Harriet and her progeny perished through deliberately poisoned baits by the Forest Department or at the hands of poachers?

A similar attempt by Billy with a leopard cub (Prince) also remained an inconclusive venture.

Antagonists of the tiger conservation idea will be quick to point out that in Texas there are nearly 3,000 tigers (Royal Bengal and Sumatran species) living in captivity inside large enclosures on the ranches of the rich Americans. But this in no way can be a living gene pool for us to reintroduce them in our wilds for two basic imponderables

First, there are no reports yet of their having littered in captivity in Texas. If they do and by the time we hand-rear them in India, they may meet the same fate as Harriet's progeny.

Worse, by then their natural prey base in India's wilds would have diminished forcing them to become cattle or man eaters. And the same disadvantage will be faced even if we were to purchase adults from this lot in Texas and reintroduce them after the extirpation of the species from its habitat.

We must save en block the last 1,000 odd surviving tigers and their habitat and create conditions for the numbers to multiply to about 5,000 animals or else India and the world would lose the tiger species from the wild-for ever.

The only option left with Prime Minister Mammohan Singh is to simply fall in the footsteps of Lord Curzon. Let us remind him of his pledge to the nation, not long ago, that he will not allow another Sariska to befall the tiger. Now he must stand up and match his words with deeds before it is too late.

Source : The Tribune, New Delhi May 2, 2008

TREKKING IN LADAKH

Kunwar Atul Raj Singh*

Kit layed out and checked a number of times to be sure that nothing is left out or missed, we packed our rucksacks as light and accommodative as possible for the Final Day. The weather packed up and a strong breeze with snow flake greeted us as the Sun went down the western ridge.

Next morning we were to get going, a team of 22 fit and confident men inclusive of porter, on a trek across the Ladhak Range from river Indus to river Shyok crossing forbidden heights and glacier. A distance of 72 km on map and a roughly over 100 km on ground in a span of 5 days. The map portrayed the route as treacherous and forbidden, it had everything gaint crevasses, ice penances, ice wall, corn ice, cliff and snow covered ground to tread on. We reached Nurla a small hamlet on the banks of river Indus after a 4 hr drive from Haunthang, collecting essential equipment for communication during the trek.

It was planned that the following day would be left aside for adm and logisitic planning, to reece and adjust our loads. All set and relaxed I glanced over my GPS set feeding in data, to facilitate us in times to come. A distant call from a Tibetan snow cock made me wonder about the thrill and adventure that lay ahead. But plans did not work out as scheduled and next morning we set off on our trek through the wilderness of Ladakh. Life had just started to grace up after a prolonged severe winter. Heavy snow had reduced to a few feet at the higher reaches, giving life to scanty little vegetation. The white mountains changed colours to emerald green with brown background, it was awake with life. We boarded our stuff into the vehicle and headed to Themis village. All happy and geared up we passed through the most beautiful lush green broad valleys of Hemis. The barren mud hills and lofty mountain could hold such beautiful valley in its laps was unbelievable. The named mud hill sides contracted with the lush green yellow and popular groves along the criss crossed water channels. Wild roses in full bloom added colour to this panormaia beauty.

Steadily the vehicle scaled along the sharp narrow bends to its final destination, the dead end of the road. Leaving us no where near civilization. We unloaded our pack and took the final count and headed in the northern direction up the fast flowing stream. The going was tough and tiring with halt at every few yards. Lungs were grasping for oxygen which is difficult to come across in abundance at such high altitudes, gradually they behaved in the manner most appropriate to its surroundings, we were able to breath in harmony.

By noon the team hit a small patch of an open lush green valley dotted with tiny stone yak huts used during simmer months as enclosures by the nomads of Ladakh. As luck would have it we encountered a herdsman with his herd of yaks heading to the good grazing grounds. He readily agreed to carry our loads on his yaks for a small amount.

Lunch was cooked and served hot and was greatly relished. After a short nap and afternoon tea, we got going again. As the day approached its end we pitched camp, only to be confronted

* Jalilpur, Bijnor, UP

with an old herdman accusing us of having stolen his sheep, and threatening us with dire consequences. The boys collected some dried cow dung and soon a lovely fire kept up, lasting till early dawn. During the process of pitching camp I strolled around with a pair of binoculars finding my self a lovely spot near the stream I scanned a steep hill side looking for ibex and bharal. It was excellent ibex country. I came across an ibex horn, most probably killed by a snow leopard. Back at camp I studied the map and made preparation/plans for the day ahead. Next day we were to cross Larglib Bila Lal (La means pass). A pass situated at a height of 5700 mtrs. the map read OPEN FROM JULY to OCTOBER. It was the first week of June now and we had the heaviest snowfall in the last 15 years and still continuing to snow every now and then.

All set we dismantled camp at 4:30 a.m. and recommenced our trek. Early morning is the best time to cross glaciated areas the snow is hard and non slippery. But by the time we reached the base of the glacier it was bright sunlight and had started getting warm. We halted here for breakfast, the porters cooked suji halwa topped up with chocolates, dry fruits, and hot tea. In the mean time my clothes also dried up. I had fallen in the stream while stepping on the rocks which were covered with ice and were slippery. Hence forth the march was tiring and treacherous as we proceeded gradually and carefully over frozen tarns (lakes) that cracked like mirrors due to our weights. Keeping our fingers crossed, hoping for the best, we moved inch by inch over the frozen lakes of unknown depth, and glaciated area fearing crevasses at each step. Tired and exhausted sweating profusely at heights where the mercury never rises, the party reached the top of the pass only to be greeted with an enormous glacier on the other side. The view of the Ladakh range was breath taking, it was an ocean of snow clad peaks and ranges competing with one another, growing taller each year with fresh deposit of snow as if trying to reach heaven. As I sat on our highest pass studying and co-relating the map, somebody remarked, "Shall we move" there is nothing for us here?" I quickly finished off my chocolate, in the mean time the wireless set was switched on – all communication with the outside world failed we were unable to relay message.

The sun was over head, the ice had started melting and was slippery. We said our prayers and finally sent the snow crushing under our feet as we descended. At time walking roped up over ice corns and snow covered crevasses, prodding each step with an ice axe we crawled down the slope of the Northern glacier. The descend was faster than expected but it was fatigue taking hold, my legs felt like a mechanical appendage carrying me on, but not totally in my control. By the time the tail closed in. I realized that the porters who had the immediate rations had gone further ahead, out of sight, cursing hell we treaded on their trail. The team was completely exhausted, it had been a treacherous walk from 04.30 a.m. and now it was 1400 hrs. We spotted the porters at last, they had halted on patch that was free of snow and had a small trickle of water running by. Lunch was cooked but I had no appetite. There was always the constant bothering of being out of communication in this forbidden land where no help can come easily. Our only hope with the outside world was the wireless set and that too packed up. My nightmare had come true. I had brought spare batteries and solar panel charger but it all proved futile.

Rechecking and co-relating the map we were on the right track, heading towards an open, better country ahead. The snow had become very soft, it was getting difficult to walk over snow covered, scree, with every step we entered waist deep in snow. We dare not halt here for the night as it was avalanche prone. It was advisable to cross the patch at the earliest. By 6 p.m. we had descended from 5700 mtrs to 4800 mtrs standing in a broad valley $\frac{1}{2}$ km wide criss crossed with multiple channels of water, an ideal breeding place for Brahmani ducks and black necked cranes. Marmots whistled around dashing from one burrow to another. We walked into a herd of wild ass that galloped to a safe distance and stood watching unafraid, it was a thrilling site, wild ass are rare to come across in this part of Ladakh. Further north it is a common sight in the Karakoram range.

We pitched camp further down the valley in a broad opening near a abandon Yachter hut. The boys fully mastered the art of pitching camp and within no time pots and pans rattled. A wire was going strong, a pillar of smoke rose steadily and defying all norms of gravity merged with the high clouds. Tea and namkeen were served I sipped it drop by drop starting at the pillar. What a happy sight it was – wilderness of rocks, ice surrounded by lofty peaks and vertical cliffs. The moon almost over the snowy peaks shone brighter in the dust free rarefied atmosphere making the snow glitter once again. it was a beautiful sight as the moon drifted across the east bathing the whole scene in soft beam. Cold dry winds started to blow making me shudder in to warmth of my tent. Having hot soup and fat saturated paranthas I slept like a log only to be woken at 4:30 a.m. with a cup of tea and hot water to freshen up. Camp dismantled stores checked and left overs properly disposed off we marched out at 5.30 a.m. passing through some of the most picturiose places on earth. I never knew that these barren mountains could produce such beautiful spots amongst its laps. Surely it was paradise an abode of god, land of lamas and herdsman.

Late in the morning we passed through a nomad's camp, a mass of absurd geometrical shaped tents and healthy looking dirty faces as its inmates who lined up to greet us. Greetings of 'juley' – 'juley' ruptured the stillness and tranquility of the peaceful mountains. On enquiring I was informed that the nearest habitation was about 20 km away and that same necessities could be bought from the village shop.

The snow lay in patches. Sometimes we crunched through pure white granulated sugar and other time we squelched and slithered through chocolate coloured mud. But it was good to see the bare muddy slopes which held promises of renewal of rebirth. The village of Gongma was in clear view on reaching the top of the knoll. lush green wheat fields and swaying willow trees. A short halt regenerated our lost stamina. This tiny village with about 15 mud roofed houses boasting a population of 50 people had nothing to be proud of, except that a big herd of bharal roamed the hillside.

Not wasting any time we went past a low Mani wall adjustment to a huge Chorten and headed to our next destination the village of Yogma. The route winded through a plain dry valley with a canal running on our right. It had become very hot by now the sun was hitting us hard. The bare hillside and dusty nala was a hideous sight and the going utterly bad. It was advisable that we halt and cook our mid day meal at the next destination.

As Yogma approached nearer, the village Chorten decked with colourful little flags, fluttering in the gentle breeze carrying the prayers across the valley and treacherous pass. I noticed a heap of ibex and bharal horns placed near the Chorten. On enquiring I was told that they had been shot and gifted to the gods as a token for good hunting. We pitched camp in a lush willow grove away from the spinning of pray wheels and chants of the village Lamas. The cook bartered some rice and fresh vegetables in exchange for kerosene oil and Milkmaid tins. The camp was in a beautiful setting with a stream gushing by. Ravens feasted on our ration and Himalayan chuffs and sparrows hopped in the branches. The owner of the grove visited us. He was in high spirit with a few cups of chang (local wine) resting in his belly, he shared our lunch and he wished us a safe journey.

As the day came to a close I sat with a binocular scanning the hillside with no luck. Before the first light lip up the snow peaks, we were treading over good beaten track. Near the journeys end we ran into a bad patch of scree boulders. The route was dominated by an over hanging cliff which bombarded the patch with stones, rubble and snow every now and then. From the distance river Shyok in its full fury was a sight as it bounded pass open expanses of gravel bounded with steep hill side, dull barren, with all its strips of rainbow colours.

As we neared our destination a feeling of emptiness swayed me. Having passed through the beautiful valley and passes of death here I stood in the midst of civilization near Turtok, the historical village that was in Pakistan prior to the 1971 war. Next day we hired a vehicle and headed for Leh. A trek scheduled for 5 days was accomplished in 3½ days. Ours was the first team to cross the La this season.

HAATHI KE DDANT (IVORY)

Dr. Prasant Singh*

Ivory is a hard, white, opaque substance that forms the bulk of teeth and tusks of animals such as elephants, hippopotamus, walrus, narwhal (moon whale), warthogs (African wild pigs) and mammoths. It has been used for centuries to make ornaments, piano keys, billiard balls, bagpipes, buttons, inlays and carvings. Amongst all the animals elephants have the longest teeth. They have paid a heavy price for their beautiful teeth as the greed for ivory has led to the ruthless massacre of thousands of elephants world wide. Now-a-days trade in ivory is banned in most countries including India. Fortunately plastics have come in as a good substitute to ivory and are almost as durable, strong and aesthetically appealing.

In humans the permanent dentition consists of

1. Incisors – the front teeth used for biting food.
2. Canines – for tearing the food.
3. Premolars-for chopping the food and
4. Molars-the back teeth for chewing the food.

Canines are prominent and large in carnivores (meat eaters like lions and tigers) and some omnivores (animals with a mixed diet like Bears). But are missing in most herbivores.

Although one would imagine elephants to have the longest canines, the fact is that elephant tusks are actually the incisors of the upper jaw. Elephants are pure vegetarians and have no canines. These tusks are used for digging for food and water and also to fight for territory and dominance over a herd.

The two species of elephants - African and Asian (Indian) can easily be identified by most of us.

All African Elephants have tusks while tusks are absent in most Asian cows and few bull elephants. So, whenever we see a large tusker in the Indian jungle we can be sure it is a male.

While humans grow two sets of teeth (milk and permanent), elephants grow as many as six sets over their lifetime. The last set comes at the age of about 40 years. By this age the animal's skull growth is close to completion. An elephant has four molars. The molars of an adult can weigh as much as 40 kgs and can grow upto two and a half feet. These teeth have jagged edges that help grind food. One molar lies on each side of the jaw and additional molars form in the back of the mouth. The molars in front gradually wear down and fall and are replaced by the ones at the back which subsequently move forwards.

The tusks as we all know are much bigger. An African Elephant shot in 1897 had tusks weighing 211 kgs. This record has yet to be broken. The prehistoric Mammoths had tusks larger and heavier than even the African Elephants. Mammoths on an average had tusks 16 feet long. The heaviest Mammoth tusk found in Columbia weighed 226 kgs.

* 14 Municipal Road, Dalanwala, Dehradun

An old wild elephant is more likely to die of starvation than die of disease or any other cause. Like humans they too suffer from periodontal (gum) disease and attrition which leads to loss of teeth. Loss of teeth leads to inability to chew food properly which further results in malnutrition and subsequent death due to starvation. Unfortunately we still can't make dentures for these majestic animals.

AN ALARM CALL OF BARKING DEER

(*Muntiacus muntjak*)

*A.M.K. Bharos Akhilesh V. Bharos

This species is fairly well distributed in the forests of the state and is found single or in pairs and keeps to more or less, thick jungle. It comes out to graze in the outskirts of the forest or in clearings. The call of the species are given out at intervals usually in the morning and evening, when alarmed these give out a series of cackling calls (Prater 1998).

T.C. Jerdon (1984) mentions its call a kind of short bark like that of a fox, but louder, both by day and night. Whereas Sterndale (1982) opines the call a sharp bark. Dunbar Brander describes that of all the deer, they are most ready to sound an alarm and will continue to do this keeping the object of their annoyance in sight. The cry to alarm is a series of continuous short cackling barks uttered when galloping away.

During our visit to the Udanti Wildlife Sanctuary, Raipur distt. on 11 May 2007, on a visit to the water hole No. 80, at 1800 hrs, a male barking deer was seen not far off from the water, in the open fringes. This deer on seeing us raised an alarm and dashed back to the forest, barking. Soon it was out of sight, but calls were heard. Though it was invisible to us, located by calls it was at a distance of about 150-200 meters on our left side, inside forest. It was evident that it was able to see us and thus kept on barking for more than 10 minutes, till we left the place. The calls were so persistent that we could even record them partially.

The behaviour commensurates with the description given by Brander but the duration of the alarm calls under similar conditions have not been described and then 10 minute period is pretty long.

This behaviour was so enthralling, hence this reference to share with the readers.

References:

- " Prater SH, The Book of Indian animals, BNHS-1998, P-294
- " Jerdon T.C., A Handbook of the Mammals of India, Mittal Publications 1984, P-264.
- " Sterndale R.A. Mammalia of India, Himalaya Books-1982, P-502.
- " Brander Dunbar, Wild Animals in Central India, Natraj Publishers 1982-P-218.

PRIVATE GAME RESERVES

(An Option for wildlife conservation)

* Dr. Prashant Singh

In the month of February, I embarked on a voyage to the continent of my dreams-**AFRICA**. The “Dark Continent” of yesteryears. A continent which had fascinated me since childhood for its virgin wilderness, rich flora, fauna and mineral resources.

As a child I had grown up seeing black bucks, wild boar and Neelgai feeding freely on our agricultural fields. It was not uncommon to be woken up in the early winter mornings by the quacking of Siberian ducks flying over our house a kilometer west towards Deega Lake in Dist. Muradabad.

We would go for an occasional shoot where the elders of the family made sure we adhered to strict rules of “shikaar”. From “how to carry the gun” to “never shoot a sitting duck” and “shoot what you can eat” the hunt was always a thrilling, enjoyable and fulfilling experience for us (urban children).

Times changed and gun licences were given away like peanuts. Every house had a weapon. In spite of the government putting a ban on hunting, indiscriminate poaching continued. Black bucks, wild boar and Neelgai vanished from our farms. They were chased and hunted in the name of “crop protection”. The results were catastrophic.

In the past two years I have not even seen a single partridge or a rabbit on my half yearly trips to the farm.

My trips to our national parks have also been disappointing. Cheetal herds of hundreds, which were common a few decades ago have now been reduced to smaller groups of tens and twelve's. Spotting other species of antelopes has also become more difficult.

On my last trip to Chilla a couple of years ago, I was shocked to hear “Bhajans” blaring out from the Chandi Devi temple (atop the mountain) in the middle of the jungle.

“Were we humans not putting too much pressure on our wild life?” I thought.

My trip to South Africa was a pleasant change from all this. It was an eye opener with respect to wild life conservation and the role a common man can play in it.

Most people visiting Africa go to the government owned national parks like Kruger (South Africa) and Serengeti (Tanzania) and miss out on the lesser known, smaller, privately owned game reserves which have contributed immensely to wildlife conservation. My trip to Morgenson Reserve gave me an insight into private conservation. Morgenson is a 3800 hectare estate owned by a man called Jess d' Clerk.

As Jess welcomed me into his camp, he told me the success story of his Black Wilder beast. A few decades ago the population of these animals had come down to about 600. The private land owners in South Africa single handedly revived the population from the brink of extinction. Jess himself has more than 800 black wilder beasts running freely on his farm.

I told Jess the story of the Asiatic Lion which was saved single handedly by the efforts of the Nawab of Junagadh. Although the initial step was taken by Lord Curzon, who declined the Nawab's offer to hunt lions and requested the Nawab to conserve the species instead.

I also told him the story of the one horn Indian Rhinoceros which was brought back from the verge of extinction after Lord Curzon's wife put pressure on her husband to save the animal (after her visit to Assam). Surely their numbers had not come back tens of thousands, as in the case of the Black wilder beast but they were in their own way success stories.

Jess makes money from his cattle and sheep at the farm. He also breeds horses. His main source of income though, is from wildlife safaris including hunting safaris.

In parts of Africa hunting is legal. The reserves with surplus animals get government permits for hunting. I would rather call it "culling" as it is very controlled and systematic.

Hunting goes by the book.

1. Sun down, Gun down
2. Only males of any given species can be shot at.
3. Males that have crossed their breeding age are preferred to younger ones. That way the pressure on land is reduced and the clients get the largest trophies.
4. One or two males in smaller herds are not targeted as this would disturb the balance within the herd.
5. Only common species found in abundance can be hunted.
6. Interestingly wildlife is given respect both in life and death. Within the reserve the animals are free to run around without any human interference. Even when they are occasionally hunted, the hunter never puts his foot on the trophy. While taking photos the hunter sits on the side with the trophy's head placed in his hands. I was reminded of the tiger hunt snaps (taken during the British Raj) where the hunter would proudly stand with one foot on the ground and the other on the dead animal.

Most importantly

7. The money earned from hunting is put back into conservation.

Jess told me that after my photo-safari there was a group of four hunters coming from America. Every species had a different price tag ranging from anything between \$250/- to \$2000/-.

"What will you do with all the money you earn from the hunt?" I asked Jess.

"I shall buy Hippos and put them in the two lakes I have." Jess informed.

Jess also told me about a friend who has a Private Game Reserve South of Morgenson which is 10,000 Hectares in area. This farm is breeding Royal Bengal Tigers for the past few years and is doing so with great success.

Tigers in AFRICA? was my first reaction.

I was later told that the Tiger is a very versatile animal. For centuries it has lived all over Asia from the Freezing Siberia to Equatorial Sumatra. If left peacefully it can survive on any continent. I was also told that there were more tigers in Private Game Reserves in America than in the wild in India.

The so called "African" Royal Bengal Tigers had undergone a complete dietary change from the Cheetal and Sambhar their forefathers ate to Springbuck and Blessbuck which they are feeding on now.

South Africa is an ideal example of wildlife conservation which India should emulate.

It is high time the government altered the Wildlife Protection Act and gave out permits to private land owners in an effort to save the ever depleting population of its wildlife.

India with its rich and diverse flora and fauna would be an ideal tourist destination for animal lovers across the world. I do agree that we do not have individual land holdings in thousands of hectares but an initial step could be taken (even on an experimental basis) for animal lovers across India owning anything more than a hundred Beeghas of land. The entire land would be fenced (for protection) and guarded. Being smaller in size they would be better managed and maintained. The supervision of Forest Officials and regular visits by senior officers of the Department would prevent foul play. The Tourism Department and the Government could give subsidies and financial help to initiate such projects.

For thousands of years man has cleared forest land for his personal use. It is time to reverse the process to ensure a better and a greener future. The main cause for decrease in wildlife is the decrease in habitat. By recovering farms into forest land we will (to some extent) restore the loss of habitat for our wild animals. I am confident that within a few decades our private game reserves will have more animals in them than those in our National Parks, as is the case in South Africa.

Let wildlife conservation be a part of globalization and privatization of our growing economy.

Wouldn't it be a great holiday to live in the luxury of a five star palace in Rajasthan and go out in the morning on a camel safari spotting Chinkara and Black Buck, or staying in a lodge in Himachal driving in a 4x4 Jeep looking for pheasants and Kakar?

If all goes well you never know there might be a time when we can even start "hunting" in our private game reserves to earn an extra buck to save the most majestic of all animal, THE ROYAL BENGAL TIGER.

From the Archives of "Cheetal"

Humane Destruction of Elephants

P.D. STRACEY

The problem of the wild elephant is daily assuming increasing importance in certain parts of India. With the disappearance of the princely and zamindar classes, the increased tempo of mechanisation in forest and timber exploitation, as well as the wide-spread use of the mighty jeep and its larger cousin, the 4-wheel-drive truck, there is little use for the domesticated elephant as a 'vehicle'. On the other side of the picture is the prolific breeding rate of the elephant in its natural state.

In the U.P. it appears that the elephant, through its rapid increase in recent years, has at last attracted the attention of the authorities and a decision has been taken to destroy elephants through the medium of adequately armed sportsmen. In Assam and Bengal, where elephant catching has declined, particularly since the war, the problem of the crop raider and marauder in certain areas is acute. In South India, also, with the increasing destruction of the forests of famous Khedda site of Mysore, elephant herds have to face a daily increasing reduction of their range, and the problem of dealing with the troublesome elephant is assuming importance.

While the average person is indifferent and the average official is callous to the deteriorating position, the thoughts of every wild life conservationist worthy of the name must go out at this critical juncture to the unfortunate elephant, which has served man on the Indian subcontinent so faithfully for thousands of years. These same conservationists must, however, face the writing on the wall, which is that the days of the elephant as a servant of man are numbered. From now on the question will assume a different aspect-how to cope with the increasing herds, how to ensure their satisfactory control and most important of all how to humanely destroy the troublesome elephant when no other solution is possible. That some elephants have to be destroyed in the interests of their class as a whole and of the human race in India, is a hard but obvious fact which must be faced. No amount of sentimentality on the subject will help us. I yield to no one in my love and admiration for this wild and magnificent creature and I have undergone many agonising moments at descriptions of attempts to shoot elephants. Some have been by mere trigger-happy sportsmen and amateurs eager for acquiring the reputation of an elephant-hunter and of a pair of elephant tusks; others by serious shikaris, quite ignorant of how to set about it but indifferent to the elementary duty of acquiring a knowledge of how to kill an elephant humanely.

When I was a young forester and had taken up elephant control at the behest of my guru, Milroy, the then Conservator of Forests in Assam, I made my mistakes as well as the next man and I was often nauseated at the results. That I was not alone in this was revealed to me one day when talking it over with a much more experienced and successful elephant hunter than myself. The

mutual discovery was that neither of us knew where precisely the brain of the elephant lay! We were both of the opinion, as every self respecting elephant hunter should be, that only the brain shot counted and only that shot should be taken by anybody attempting to kill an elephant. The rest of it, we agreed was sheer butchery. And so we got a hold of an elephant's skull and cut it up with a two-man cross cut saw. To say that we were surprised at the correct position of the brain as opposed to the popular conception of the same was to put it mildly. From then on I became a student of the anatomy of the elephant's head. I repeatedly cut up skulls of dead elephants and examined them with respect to the external contours of the skull, measuring and comparing with a live elephant, my Mohan Prasad, standing by until I was word perfect as to the shots to be taken to reach the brain. Photographs which I took twenty five years ago are reproduced here for the benefit of my readers and in the interests of the elephant.

To summarise, I venture here to lay down a few axioms for the average sportsman taking up elephant hunting.

1. Never attempt an elephant until you have a sufficiently powerful and heavy rifle. Double rifles of .400 bore and upwards using modern powder cartridges are to be preferred. Of the single rifles the .423 Mauser is the very lowest limit. The small-bore high-powered rifles are only for the real experts. It is to be remembered that it is the stopping power of a rifle which counts with such a large and powerful animal.
2. No shot should be taken at more than fifty yards at the outside though thirty yards is more the desired distance. This may seem as merely a challenge to the sportsman's guts, but this is a game which calls for courage and the nearer one gets to the elephant the more the chances of success.
3. The best shot is the temple shot. To pin-point this accurately is may be described as a shot at an angle of 45° to the direction in which the elephant is facing, at a spot in the hollow of the temple a little above the line joining the ear-hole with the eye. A good mark is the protuberant cheek-bone of the elephant, which is even more marked in the case of males by the discolouration caused by the exudation of the musth fluid.
4. The frontal bump shot is not to be trusted, as apart from the opening and the passage being small the entry of the bullet to the brain can be vitally affected by even a slight movement of the head and by the position at which the latter is carried, leaving aside errors caused by differences in levels between the positions of the sportsman and the quarry.
5. The so-called ear shot is the least likely to achieve success. The thickness of the wall of cellular bone surrounding the brain is maximum along the axis of the ear holes and minimum at the temples (as can be seen from the photograph).
6. The back-of-the brain shot illustrated in one of the photographs is only to be taken when the elephant is down but not dead. For this the sportsman must go right up to the animal as it is lying down and fire a bullet into the back of the skull, at the point where the mahout usually applies his goad, i.e. where the two lobes of the skull fall away below the neck.

This shot is to be taken with the rifle pointing parallel to the front legs and to the trunk of the elephant when held in the normal position i.e., straight down towards the ground. The best way of

taking this shot is to squat down behind the head of the elephant, with the rifle held close to the back of its skull. If this description of the shot is considered to be too much of a challenge to the average hunter, I would again stress the fact that this game of elephant shooting is not for the timid person.

7. Finally, and this is the most important of all, no one should attempt to take an elephant unless he has studied pictures of the position of the brain and preferably examined a dissected skull of an elephant thoroughly.

“Cheetal” quarterly News

With 4 student members the membership of Wild Life Preservation Society of India continues to rise.

During the quarter 4 student member were added to the WLPSI apart from one Institutional life member, 4 Life members and 4 annual members. We warmly welcome the following members to our society

S. No.	Name & Address of member	Type of membership
1	Hement Singh Managing Trustee Siddarth Singh Natural History Trust Kalwar Road, Jhotwara Jaipur-302012 Rajasthan	Institutional Life Member
2	Dr Vijay Prakash Singh Reader, Dept. of Zoology Y.D. (PG) College Lakhimpur Kheri 262701 U.P.	Life Member
3	Dr. P.K. Johri & Reeta Johri Reader, Department of Zoology D.A.V. College Kanpur UP	Life Member
4.	Sri M.S. Bisht Reader in Zoology HNB Garhwal University Campur Pauri Garhwal 246001 (UK.)	Annual Member
5.	Sri Ganesh Datt Bhatt Senior Project Assistant ICFRE, Dehradun	Annual Member
6.	DR. Mahendra Singh Chauhan Consultant Neurosurgeon Mahant Indresh Hospital Patel Nagar, Dehradun (UK.)	Annual Member

7. Sri Aaditya Vikram Singh Chauhan
C/o Mr. Mahendra Singh Chauhan
Sri Mahant Indresh Hospital
Patel Nagar Dehradun (UK.) Student Member
8. Sri Sanjai Rawat
C/o Dr. Prashant Singh
14 Municipal Road
Dalanwal Dehradun (UK.) Annual Member
9. Sri Pankaj Shah, Director
178-B, Pandit wari II
Dehradun 248007 (UK.) Life Member
10. Sri Komal Shah
178-B, Pandit wari II
Dehradun 248007 (UK.) Student Member
11. Sri Rishabh Shah
178-B, Pandit wari II
Dehradun 248007 (UK.) Student Member
12. Km. Neha Pandey
105 Sewla Kala, Chandrabani
Mandir Marg PO Mohabey wala, Dehradun Student Member
13. Sourabh Upadhyay
34, Karanpur, Dehradun - 248001
E-mail : upadhyay.sourabh@gmail.com Life Member

NB- Ms Purva Mehta of Hardwar has worked hard in editing this issue of Cheetal. We thank her for her contribution. She has offered to continue the editing of Cheetal in future also. Her husband Rajeev Raj Mehta is an active life member of our Society.

Members of Wildlife Preservation Society conduct Nature Trek to Dodital (Uttarkashi District Uttarakhand)

The second Nature Trek sponsored by Uttarakhand Council of Science & Technology (UCOST) was conducted from 9th to 12th October 2008. Inspite of wide publicity through our quarterly journal Cheetal the response was poor. Seven persons under the leadership of Mr. A.S. Negi,

Executive Vice President of the society started from Dehradun on 9th October at 8 am and reached Agoda after a 6 Km. steep climb by late evening same day. On 10th Oct, the group trekked 16 Km. distance to Dodital through a dense virgin forest of Oaks, Fir, Maples, *taxus baccata* etc. Some of the participants were rewarded by a brief glimpse of multicoloured Monal pheasant (The state bird of Uttarakhand). Mr. A.S. Negi introduced various species of trees & shrubs & different types of forest ecosystems. Dodital is a high altitude lake surrounded by fir & oak forest & high mountains. It has a good population of rainbow trout (Fish) introduced in the pre-independence period by Britishers. Fishing in the lake has been prohibited since last 4 years. The forest rest house is a good place to stay. Yet another rest house is under construction. We were accompanied by a Forester & local Forest Guard. Field Staff has good knowledge of medicinal plants of the area & was helpful in identifying large number of medicinal and aromatic plants during the trek. Mr. Pathak, Divisional Forest Officer Uttarkashi was very helpful in making the trek comfortable & memorable. We trekked the entire distance of 22 km next day & reached Dehradun on 12 Oct. 08.

Animal Kingdom

Sir,

This is with reference to the editorial, "Ape and Superape" (1 April). All too often does the media carry reports on the dwindling tiger population. Yet naturalists and wild life enthusiasts must not ignore the fate of some of the more endangered species of animals, marine creatures and birds. They too are part of our natural wealth.

The endangered species includes the Asiatic Lion, the Indian wild buffalo, the Chinkara (Indian gazelle), snow leopard, the clouded leopard and the Golden langur. The last two are to be found only in Assam. The category of endangered reptiles and fish includes the gharial and the Gangetic dolphin.

As for birds, the vulture can hardly be seen these days. Similar is the position of the common kite – once a familiar sight in any village or town. Virtually extinct too is the Brahminy Kite (orange body with a pure-white neck and head) and the "scavenger kite" (white and cream) which used to feed on carrion in the municipal dumps.

In fact, they rendered better service than our municipal workers. And whatever has happened to the common house sparrow? They would mess up the verandah, specially during the nesting period, but frankly I miss their chirping and chatter. The champions of the save the tiger campaign or the forest department for that matter do not seem to have made headway in their laudable mission. The tiger population is coming down every year. There should be less of rhetoric and more of silent and dedicated effort by the nature lovers. Yours, etc, Kamal Singh, Dumraon (Bihar), 15 March.

Source : *The Times of India*, New Delhi April 6, 2008

Our Survival Is At Stake

Vanishing tigers are a biodiversity Crisis

By KAMALJITS BAWA

Government Officials and politicians have suddenly woken up to missing tigers in our wildlife sanctuaries, tiger reserves and national parks. Manmohan Singh, after Indira Gandhi, might well be the first prime minister to take a strong interest in our wild heritage. Tigers, being on top of the food chain, symbolise the entire gamut of wildlife, but by talking about missing tigers we are actually missing the whole point about the tragic plight of the wilderness in our country.

Trade in tiger products may well be a key factor in the disappearance of tigers. However, the slide in tiger population began with the loss and degradation of its surviving habitat, and that continues to this day. Development activities in the form of new roads, hydroelectric dams and mining have destroyed many habitats. Human pressures have reduced large contiguous pieces of forests to small, isolated patches that are too small to hold viable populations of large animals such as tigers, elephants and other wide ranging species. Missing tigers are just the tip of an iceberg of environmental follies.

If these follies were not enough, we have alienated local communities by not addressing their basic livelihood needs. We have denied or restricted their access to their ancestral lands. In the process we have converted potential allies into adversaries in our battle to save nature.

Our onslaught on nature affects not just tigers but all wildlife. Our forests, including wildlife sanctuaries and national parks, are so degraded that they have completely lost many species of wild animals. True, we have some forests left, but most of these forests are what biologists call empty forests. These empty forests are degraded by exotic weeds from other continents such as *lantana camara* that spread in the openings created by human disturbance.

Such species compete for space and other resources with native species and threaten the successful regeneration of trees and other plants. Grazing and extraction of produce from forests is rampant. We are left with empty forests and dysfunctional ecosystem.

Apart from human pressures, other threats loom large. Climate change – changing temperature and rainfall patterns – is likely to add to the existing pressure on natural habitats. While current habitats turn inhospitable for a range of species and ecological communities, they may not have other places to shift, with humans using most of the remaining habitats.

India is home to two of the 33 global biodiversity hot spots – the Western ghats and the Himalayas. These hot spots contain thousands of plants and animals found nowhere else on the planet. Wild species provide us a range of products for our daily use. Forests serve us by providing clean water at a sustained rate, releasing nutrients for soils and removing harmful chemicals from the air.

Wild bees pollinate our crops. Other insects act as predators of agricultural pests. Economists have estimated that the value of such services on an annual basis often exceeds the gross domestic product of the country. By destroying nature, we are not only taking the path of

bankruptcy but also robbing future generations of assets that we inherited from our ancestors for passing on to our descendants.

Missing tigers symbolise a much larger problem, our failure to protect the entire gamut of life, including ourselves, from our own actions. Our political leaders have made matters worse by believing that nature can be protected by deploying guards and other forces in wildlife sanctuaries and national parks, as though curtailment of poaching will cure our ills. The approach displays an utter lack of understanding of the problem and its underlying causes. The whole notion that only tigers and elephants, and not the entire complement of wild species and the ecosystems in which they occur, are threatened is an affront to human intelligence. The idea that our paramilitary forces can bring back the tigers and elephants indicates the inability of the proponents to understand and the complex web of forces driving the wilderness to extinction.

Our wildlife problems can not be resolved without fundamental changes in our attitudes towards nature and an appreciation of the immense ethical, spiritual, environmental and economic value of wilderness. We would need a strong political will to resist pressures to exchange short term development goals for the long term environmental benefits of nature. Easier form in policies and governance would be required to develop new paradigms of conservation that involve the communities in conservation and protection of nature. Modern science and alternative knowledge systems should be tapped to manage protect and replenish nature. We cannot afford to fail. What is at stake is not only the survival of nature, but also of ourselves.

Source :The Times of India, New Delhi May 19, 2008

First Tiger relocation was done in 1930

A pair of Big Cats from Gwalior Were Shifted to Dungarpur Partly By Train, Bullock Cart, Truck
Prakash Bhandari

Jaipur: There were no choppers then. It would be another six years before the Germans would build the Focke-Wulf Fw 61, the world's first practical helicopter. Radio collars then were beyond the realm of even science. And it would be another 20 years or so before New Zealander Co.,lin Murdoch would invent the tranquilizer gun. This was 1930. Not many then frowned upon big-game hunting, or even realized that tigers would eventually become an endangered species.

But even then, tigers were vanishing from some forests. As the then ruler of Dungarpur Maharawal Lakshman Singh (his son was the famous cricketer, Raj Singh Dungarpur) realized in 1928. He became the ruler of this small principality in 1918, when he was still a minor, and then went to Mayo College, Ajmer, to finish his studies. When he returned in 1928, he found that not a single tiger was to be found in the dense forests of his principality. All of them, it turned out, had fallen prey to shikar.

The Maharawal was furious. As he had been a minor; the principality was being run by a British political agent, Donald Field. He had a fondness for shikar, and it seemed that he and his friends had managed to wipe out the Dungarpur tiger population. Furious, the Maharawal shot off a letter to Delhi demanding an explanation. What followed would make the tiger relocation from Ranthambore to Sariska look like child's play.

The British saw the Maharawal's point, and were willing to humour him. They suggested that two tigers be relocated from the jungles of Gwalior to Dungarpur.

A dealer, who was supplying tigers to various zoos, was given the job of getting the big cats for the Maharawal. And so it happened that the world's first tiger relocation project was set in motion. (Sariska, incidentally, is the second one).

Two tigers—a male and a female—were caught, caged, and put on a train to Talod in Gujarat. But Talod was still some 80 km. away from Dungarpur. It seems a miracle the tigers survived the 80 km. journey, mostly on bullock carts, and for some stretches, where there were roads, on trucks. Once the tigers reached the jungle, the Maharawal banned poaching. He even stopped his two brothers from going game-hunting in the forests. The tiger population steadily increased. At the time of Independence 25 tigers were reported in the forests of Dungarpur.

The late Maharawal remained a crusader throughout. His last great appearance for conservation was at the international symposium on bustards in 1980 in Jaipur, said Harsh Vardhan, secretary general of Tourism and Wildlife Society of India.

But the Maharawal also killed a tiger. In fact, it was one of the two he got from Gwalior. It was a mercy killing, though. The tiger had lost its teeth, its movement was slow, and the Maharawal was afraid it would become a man eater. So one day, he went out with his gun, and shot Bokha (the toothless one), as the tiger was then being called. It has been stuffed and preserved at the Udai Vilas hotel in Udaipur.

And as for Dungarpur forests to day, they are empty again. Poachers made sure of that.

Source : The Times of India, New Delhi July 8, 2008

Gore Sets 'moon shot' warming goal

Washington: Just as John F Kennedy set his sights on the moon. Al Gore is challenging the nation to produce every Kilowatt of electricity through wind, sun and other Earth-friendly energy sources within 10 years, an audacious goal he hopes the next president will embrace.

The Nobel Prize-winning former vice president said Barack Obama and John MC-Cain are "way ahead" of most politicians in the fight against global climate change.

Rising fuel costs, climate change and the national security threats posed by US dependence on foreign oil are conspiring to create "a new political environment: that Gore said will sustain bold and expensive steps to wean the nation of fossil fuels. "I have never seen an opportunity for the country like the one that's emerging now," Gore said. He said he fully understand the magnitude of the challenge.

The Alliance for Climate Protection, a bipartisan group that he chairs, estimates the cost of transforming the nation to so-called clean electricity sources at \$1.5 trillion to \$3 trillion over 30 years in public and private money. But he says it would cost about as much to build ozone-killing coal plants to satisfy current demand.

"This is an investment that will pay itself back many times over." Gore said. "It's an expensive investment but not compared to the rising cost of continuing to invest in fossil fuels."

Called an alarmist by conservatives, Gore has made combatting global warming his signature issue, a campaign that has been recognized worldwide—from an Academy award to a Nobel Prize. “I hope to contribute to a new political environment in this country that will allow the next president to do what I think the next president is going to think is the right thing to do,” Gore said. “But the people have to play a part.” He likened his challenge to Kennedy’s pledge in May 1961 to land a man on the moon by the end of the decade.

Gore narrowly lost the presidential race in 2000 to George Bush after a campaign in which his prescient views on climate change took a back seat to other issues. While dismissing a suggestion that he pulled his punches eight years ago, Gore said his goal now is to “enlarge the political space” within which politicians can “deal with the climate challenge.”

To meet his 10 year goal, Gore said nuclear energy output would continue at current levels while the nation dramatically increases its use of solar, wind, geothermal and clean coal energy. Huge investments must also be made in technologies that reduce energy waste.

Source :The Times of India, New Delhi July 18, 2008

Canal diverted to save India's rarest bird

New Delhi: The only known habitat of one of the world's rarest birds has been saved from destruction. Thanks to a compromise between environmentalists, villagers and the Andhra Pradesh government, the 400 km Telgu Ganga Canal, which will stretch from Srisailam in Central Andhra to Chennai, will be diverted, around the only remaining habitat of the Jerdon's courser, a striking nocturnal bird, the size of lapwing and found only in one region of Andhra Pradesh.

Scientists believe there may be only 50 of the birds left and feared that the canal's original route would have destroyed its scrub-jungle habitat.

Now, nearly three years after the Supreme Court halted canal construction because of the threat it posed to the courser, an impressive compromise is in place. At the urging of the Bombay Natural History Society (BNHS), an NGO, the state irrigation ministry has agreed to reroute the canal.

The government has also agreed to add 3,000 acres of adjoining land to the courser's sanctuary. It has already acquired much of this and villagers have been given compensation.

Thrilled by the development, Dr. Panchapakesan Jegannathan, a scientist at BNHS who has been fighting the battle for the courser's habitat for the last eight years, said, “This bird is more threatened than the tiger. Now, there is a very good chance that it will survive.

The British surgeon TC Jerdon, was the first to see the Jerdon's courser in 1848. The bird was thought extinct in 1900 until its rediscovery in the Kadapa District of Andhra Pradesh 22 years ago. Categorized as critically endangered in the IUCN Red List, it has been seen only 10 times.

Source :The Times of India, New Delhi August 19, 2008

Cubs of dead tiger safe

Ranthambore Staff Wants To Rear Them In the Wild

Anindo Dey

Jaipur: Officials of forest department have found the two cubs of the tigress which died in what appears to be a territorial fight at the Ranthambore tiger reserve. The eight month old cubs were found near a waterhole on Wednesday evening.

According to officials for three days, nearly 80 persons searched the area at the reserve where the eight-year old tigress was found dead. They finally found the cubs near a waterhole at the reserve. The cubs are in fine health. though they did not have a meal till then, being next to a waterhole saved them from dehydration, an official said.

On Monday evening, forest officials had found the decayed, maggot-eaten body of a tigress with body parts like teeth, nails and skin intact. Ruling out poaching, the forest officials concluded that death could be due to territorial fight.

Investigations revealed that another tigress was staying in the territory close to where the dead one was found. She has three grown up cubs, which are ready for separation having reached the age of three years. These cubs, too, will soon try to establish their own territory. The mother of the grown up cubs may have got into a fight with the tigress with the young cubs to protect her territory officials said.

Having recovered the carcass, the officials were in a fix as they were not sure if the cubs belonged to the dead tigress. But searches in the area revealed two lonely cubs and it was concluded that the deceased was their mother.

Now, the biggest task before the forest officials is to ensure the cubs remain safe from other tigers and are able to get their food. "We have fed them with some meat. Both of them have eaten about six kg. But we have to find out a ways to sustain them for a longer period of time. We don't want to give them off to a zoo and will prefer to keep them in the wild," official added.

Though territorial fights are common in jungles, a tigress killing another tigress is not so common. Probably in this case, one of the tigress would have punctured the other's blood vessel, resulting in death due to excessive bleeding, officials said.

Source :The Times of India, New Delhi Sept 6, 2008

Warmest March on record over World land surfaces

Washington: Planet Earth continues to run a fever. Last month was the warmest March on record over land surfaces of the world and the second warmest overall worldwide. For the United States, however, it was just an average March, the National Oceanic and Atmospheric Administration reported on Thursday.

NOAA'S National Climatic Data Center said high temperatures over much of Asia pulled worldwide land temperatures up to an average of 4.9⁰c 1.8 degrees warmer than to an average

in the 20th century. While Asia had its greatest January snow cover this year, warm March readings caused a rapid melt and March snow cover on the continent was a record low.

Global ocean temperatures were the 13th warmest on record, with a weakening of the La Nina conditions that cool the tropical Pacific Ocean. Overall land and sea surface temperatures for the world were second highest in 129 years of record keeping, trailing only 2002 the Data Centre said.

Warming conditions in recent decades have continued to raise concern about global climate change, which many climate experts believe is related to gases released into the atmosphere by industrial and transportation processes. The climate Center said that for the 48 contiguous States it was about average, ranking as the 63rd warmest march in 113 years of record keeping.

"Cheetal" Young Readers Section

Ornithology in India: A Brief History

The Pioneers: Bird study started in India in the beginning of the 19th century. The East India Company was by then established as a major presence in control of much of the Indian territory. The Company employed Britishers and stationed them at various places. The pioneers of Indian ornithology came from the East India Company's personnel. Bird study was their hobby, to be indulged in during their spare time.

Pioneering work was carried out during the first sixty years of the 19th century. That period was dominated by T.C. Jerdon, Brian Hodgson, and Esward Blyth. Much of the knowledge gathered by them and some others lay scattered in the manuals of the Zoological Society of London, and the journals of the Linnaean and Asiatic Societies.

Birds of India by T.C. Jerdon was the first important work published in 1862. It gave a general boost to the study of birds and remained a standard work on Indian ornithology for many years and has retained its usefulness even today.

Thereafter four volumes on birds by E. W. Oates and Blandford appeared in the *Fauna of British India* from 1898. Bird study received another great impetus by the publication of these books.

The period between the publication of Jerdon's *Birds of India* (from 1862 to the publication of the above four bird-volumes in 1898) was completely dominated by A.O. Hume, a civil servant already working in British India (also one of the founders of India National Congress). He is known as the "Father of Indian Ornithology". He collected 60,000 skins, and a large number of nests and eggs of Indian birds, with the help of associates, Hume published and edited *Stray Feathers*, a journal of Indian ornithology from 1872 to 1888. These 11 volumes have remained an indispensable source of information on Indian birds. Most of the important papers on birds were published therein.

The BNHS: It was mainly because of the enthusiasms of Edward Hamilton Aitkin (popularly known as EHA) and some others that Bombay Natural History Society (BNHS) was founded in 1883. It was a major event for natural history of the Indian sub-continent. The Society provided a forum for exchanging notes on observations and experiences of its members regarding birds, animals, insects, etc.

The Society started publishing a journal from January 1886. It now has a glorious unbroken published record of more than a century to its credit. The Journal is among the standard and reputed periodicals of the world. Large numbers of interesting and important articles on ornithology have been, and are still being, published in it.

More Classics: Other important publications of that period were Edward Hamilton Aitkin's *The Common Birds of Bombay*, a classic of graphic and captivating writing. Stuard Baker's three volumes on *Games Birds of India, Burma and Ceylon* with excellent colour plates was published in 1943. It was the first book published by BHNS.

The Fauna Updated: As a result of observations of many new bird enthusiasts, a great deal of new material on birds became available. The need to revise and update the Fauna by incorporating the new information was felt. Stuard Baker took up this work and completed it from 1922 to 1930. These volumes were well-written in a popular language, and are generally known as *New Fauna*.

In the meantime another book appeared in 1928. It was written by High Whistler, an Officer of the India Police Service. The Book named *Popular Hand-book of Indian Birds* had first class illustrations, coloured as well as black and white.

Birdmen of India: The first Indian to write authentically on birds was Salim Ali. The *Book of Indian Birds* was published in 1941. It proved very popular as all its illustrations were in colour and the habits of birds were described in a style and language that made it a pleasure to read. This book has retained its popularity even over 50 years after its printing. This was the first of many more books by Salim Ali which include: *Birds of Kachchh*, *Birds of Kerala*, *Birds of Sikkim*, *Indian Hill Birds*, and *Birds of Eastern Himalayas*.

Besides Salim Ali, R.S. Dharmakumarsinhji was another great ornithologist and wildlife expert of high calibre. His *Birds of Saurashtra* published in 1955 was the result of the intensive study of birds, spread over his lifetime.

Birds of Delhi by Mrs. Usha Ganguli, *Sixty Indian Birds* by R.S. Dharmakumarsinhji and Lavkumar Khachar and *A Synopsis of The Birds of India and Pakistan* are notable additions to the bird literature of India.

Humayun Abdulali, Biswamoy Bishwas, Lavkumar Khachar, Zafar Futehali, K.K. Neelkantan, Himatsinghji Jadeja and Late Shivakumar Khachar are some of the prominent ornithologists of present day India.

Birds Books: the publication (from 1968 to 1973) of the ten volumes of *Handbook of the Birds of India and Pakistan*, by Salim Ali and S. Dillon Ripley made available a work that presented scientific accuracy and profuse colour illustrations in a non-technical language. The publication of *The Pictorial Guide to the Birds of the Indian Subcontinent* also by Salim ali and S. Dillion Ripley

provides a comprehensive description of 1241 species of Indian Sub continent and includes several plates in colour and black and white.

Some Premier Institutions in Ornithology

Several Institutions have contributed to the field of ornithology in India. Some of these are:

Bombay Natural History Society (BNHS)

Since 1976 it has been publishing a pictorial periodical "Hornbill" catering to the needs of an ever increasing number of birdwatchers and nature lovers.

Zoological Society of India, Calcutta

This was founded in Calcutta. It has been carrying out useful work, surveys and researches in ornithology and other natural history sciences.

Birdwatchers Field Club of India

It was started by Zafar Futehally in 1959 and began publishing "Newsletter for Birdwatchers" initially as a monthly and later as a bi-monthly. This has been playing an important role in popularizing birdwatching as a hobby.

Prince of Wales Museum, Mumbai; Museum, Calcutta, National Museum of Natural History, New Delhi are some of the other museums that help in their own way in furthering the interest in birdwatching.

Institutions for Higher Studies in Ornithology

1. Bombay University, Mumbai (Maharashtra).
2. Bombay Natural History Society, Mumbai (Maharashtra).
3. Aligarh Muslim University, Aligarh (U.P.)
4. Dayalbagh University, Agra (U.P.)
5. Osmania University, Hyderabad (Andhra Pradesh).
6. Maharaja Sayajirao University, Vadodara (Gujarat).
7. Indian Institute of Science, Bangalore (Karnataka).

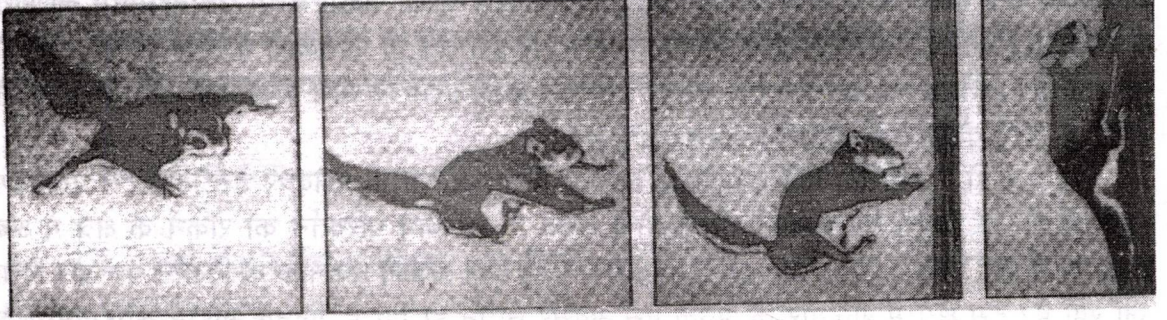
Facilities for Field Research

1. Bombay Natural History Society, Mumbai.
2. Gujarat University, Ahmedabad (Gujarat).
3. Saurashtra University, Rajkot (Gujarat).
4. Wildlife Institute of India, Dehradun (U.P.).
5. Salim Ali Centre for Ornithology and Natural History, Coimbatore (Tamil Nadu).
6. Gujarat Agriculture University, Anand (Gujarat).
7. Andhra Pradesh Agricultural University, Hyderabad (A.P.).
8. Punjab Agricultural University, Ludhiana (Punjab).
9. Indian Agricultural Research Institute, New Delhi.

Some Useful Bird Books

- Ali, Salim, The Book of Indian Birds Bombay; Bombay Natural History Society (BNHS) Oxford University Press, Mumbai, 1996.
- Ali, Salim, Birds of Kerala, Bombay: Oxford University Press (OUP) 1986.
- Ali, Salim. The Birds of Sikkim, Bombay: OUP 1962, reprint 1989.
- Ali Salim, Indian Hill Birds, Bombay: OUP 1949, 1979.
- Ali, Salim, Field Guide to the Birds of the Eastern Himalayas. Bombay: OUP 1977.
- Ali, salim & D. Dillon Ripley. The Handbook of the Birds of India and Pakistan: 10 Vols. Bombay: OUP 1968-74.
- Chopra, U.C. Our Feathered Friends, New Delhi, Children's Book Trust, 1984.
- Dharamkumarsinjhi. R.S. The Birds of Saurashtra. Bombay: 1957.
- Dillon Ripley S. A Synopsis of the Birds of India and Pakistan, Bombay: BNHS, 1982.
- Ganguli, Usha. A Guide to the Birds of the Delhi Area, New Delhi: 1975.
- Gaur, R.K. Indian Birds, New Delhi, Brijwasi, 1994.
- Grewal, Bikram. Birds of India, Bangladesh, Pakistan and Sri Lanka. The Guidebook Company Ltd. 1993.
- Kalpavriksh, What's that Bird? New Delhi, 1991.
- Hawkins, R.E. (ed) Encyclopedia of Natural History, BNHS*OUP, 1986.
- Some Indian Birds, Children Book Trust, 1984.
- Whistler, Hugh. the Popular Handbook of Indian Birds. London 1949 (4th edition), reprinted Dehradun; Natraj, 1989.
- Woodcock, Martin. handguide to the Birds of the Indian Sub-continent, London:Collins 1980.

उड़ने वाली गिलहरी क्या है?



गिलहरी आस्ट्रेलिया को छोड़कर संसार के सभी देशों में मिलती है, इसका आकार चुहे से लेकर बिल्ली के बराबर तक होता है। इसकी बहुत सी किस्में होती हैं। लेकिन मुख्य दो ही हैं। जमीन पर रहने वाली और पेड़ों पर रहने वाली, इसके अलावा एक प्रकार की गिलहरी और भी होती है, जिसे उड़ने वाली गिलहरी कहते हैं।

उड़ने वाली गिलहरी के बाजू में एक झिल्ली जुड़ी होती है, जब यह अपनी टांगों को फैलाता है, तो यह झिल्ली ग्लाइडर के पंखों की तरह फैल जाती है इन की सहायता से यह उड़कर एक पेड़ से दूसरे पेड़ पर पहुँच जाती है, उड़ते समय यह इस बात का ध्यान रखती है कि इसका कोई शत्रु हमला तो नहीं कर रहा है। यदि इस पर उल्लू या अन्य शत्रु हमला करते हैं, तो यह फौरन उसी पेड़ पर वापस आ जाती है और छुप जाती है।

उड़ने वाली गिलहरीयों की लगभग 35 किस्मों का अध्ययन किया जा चुका है, ये गिलहरीयों उत्तरी अमेरिका, अफ्रीका, यूरोप और एशिया के कुछ भागों में पाई जाती हैं, लोगों को ये बहुत ही कम दिखाई देती हैं, क्योंकि दिन के समय में ये अक्सर सोती रहती हैं।

इनके शरीर पर मुलायम बाल होते हैं, इनकी आँखें बड़ी बड़ी होती हैं, पूँछ को छोड़कर इनकी लम्बाई 8 से 60 सेंटीमीटर तक होती है, ये पेड़ों के तनों को खोखला कर रही हैं यह बादाम, अखरोट फल और कीड़े मकोड़े खा कर जिन्दा रहती है, इन्हें रात में साफ दिखाई देता है, ये 60 मीटर की दूरी तक लम्बी उड़ानें भर सकती हैं।

जलवायु परिवर्तनों पर रखे नजर

पूनम जैन

प्राकृतिक कारणों से लेकर मानवीय गतिविधियों के चलते हो रहा पर्यावरण नुकसान विश्वभर में चिंता का कारण बना हुआ है। सरकारी व निजी स्तर पर पर्यावरण सुरक्षा संबंधी कदम उठाना समय की मांग बन गया है। इन्हीं वजहों से राष्ट्रीय अंतराष्ट्रीय स्तर पर इस क्षेत्र के जानकारों व विशेषज्ञों की मांग भी बढ़ रही है। विशेषज्ञ भी मानते हैं कि पर्यावरण विज्ञान व बिजनेस के साथ प्रौद्योगिकी की डिगरी रखने वालों के लिए कैरियर के बेहतरीन अवसर उपलब्ध हैं।

हाल ही में अमेरिका की टपट्स यूनिवर्सिटी, मैसाच्यूसेट्स के फ्लैक्वर इंस्टीट्यूट से पर्यावरण नीति में मास्टर डिगरी करके लौटे नीरज दोषी कहते हैं, जलवायु परिवर्तन को रोकने के क्षेत्र में अब रोजगार के कई अवसर सामने आ चुके हैं। बड़े पैमाने पर इको फ्रेंडली तकनीक के विकास पर जोर दिया जा रहा है। इस क्षेत्र में रोजगार के अनेक ऐसे अवसर उत्पन्न हो गए हैं, जिनके बारे में लोग अभी तक अनजान रहे हैं।

रोजगार के अवसर

पर्यावरण साइंस, इंजीनियरिंग प्रबन्ध, वित्त प्रबन्धन आदि में विशेषता रखने वालों के लिए पर्यावरण क्षेत्र में कई ऑप्शंस मौजूद हैं। कार्बन क्रेडिट ट्रेडर के तौर पर आप अंतराष्ट्रीय बाजार में क्योटो प्रोटोकॉल की जरूरतों को पूरा करने हेतु कंपनियों के कार्बन ऑफसेट्स क्रेडिट खरीदने और बेचने का काम कर सकते हैं। क्लीन कोल टेक्नोलॉजिस्ट कोयला का काम करते हैं। क्लीन डेवलपमेंट मेकेनिज्म एनालिस्ट विभिन्न परियोजनाओं के निर्माण व उनमें निहित जोखिम के मूल्यांकन का काम करते हैं। क्लीन एनर्जी डेवलपमेंट एक्सपर्ट नवीनीकरणीय ऊर्जा व ऊर्जा क्षमता से संबंधित परियोजनाओं में काम करते हैं। एनर्जी इकोनोमिस्ट ऊर्जा नीतियों व ऊर्जा आपूर्ति संबंधी कार्यों के आर्थिक मूल्यांकन का काम करते हैं। विभिन्न क्षेत्रों में ऊर्जा की खपत, प्रकृति व उनके अधिकतम उपयोग के संबंध में एनर्जी एफिशिएंसी एक्सपर्ट्स की आवश्यकता होती है। इको फ्रेंडली तकनीक व उच्च संसाधनों में इस्तेमाल की जाने वाली प्रौद्योगिकी व बेहतर उपकरणों के लिए इंजीनियर्स की जरूरत होती है।

कंपनी की विभिन्न तकनीक व औद्योगिक परियोजनाओं का पर्यावरण पर प्रभाव, कंपनी के कार्बन फुटप्रिंट व उनके जोखिमों का मूल्यांकन करने के लिए एनवायरमेंटल इंपैक्ट एसेसमेंट एक्सपर्ट्स की नियुक्ति की जाती है। ऊर्जा की वचत करने वाले तरीकों का पता लगाने, सिस्टम डिजाइन करने और उनका उपयोग करवाने संबंधी कामों के लिए एनर्जी ऑडिटर की सेवाएं ली जाती हैं। कॉरपोरेट उपक्रमों में ऊर्जा प्रबन्ध संबंधी कार्यों के प्रमुख तौर पर एनर्जी मैनेजर्स को रखा जाता है पावर डिस्ट्रिब्यूशन इंजीनियर वैदर डेरिवेटिव ट्रेडर, सोशल डेवलपमेंट स्पेशलिस्ट के अलावा ऊर्जा का उपयोग कम करने की नई प्रौद्योगिकी के आविष्कारों से लेकर समर्थन संगठनों के लिए आंकड़े एकत्र करने व उनके विश्लेषण के लिए रिसर्चर के तौर पर भी काम कर सकते हैं।

योग्यता

देश में ग्रेजुएशन स्तर पर कई विश्वविद्यालयों द्वारा पर्यावरण विज्ञान पर आधारित पाठ्यक्रम चलाए जाते हैं। इसमें बीएससी, पर्यावरण विज्ञान और बीई स्तर के पाठ्यक्रम शामिल हैं। दाखिला चयन के आधार पर होता है। बीई पाठ्यक्रमों में जीवविज्ञान की शैक्षिक पृष्ठभूमि की अनिवार्यता नहीं है। इसके अलावा एमएमसी और एमटैक सरीखे पर्यावरण विज्ञान आधारित पाठ्यक्रम भी संचालित किए जाते हैं। डॉक्ट्रेट स्तर की शिक्षा के विकल्प भी उपलब्ध हैं। इसके अलावा पारिस्थितिकी व पर्यावरण में द्विवार्षिक स्नातकोत्तर डिप्लोमा पाठ्यक्रम पत्राचार माध्यम से भी उपलब्ध है।

अधिक जानकारी के लिए

◆ द एनर्जी ऐंड रिसोर्स इंस्टीट्यूट, नई दिल्ली।

www.teriin.org.

◆ इंडियन ग्रीन बिल्डिंग काउंसिल

www.igbc.in

◆ भारतीय पारिस्थितिकी एवं पर्यावरण संस्थान, मैदान गढ़ी, नई दिल्ली।

◆ नेशनल एंवायरमेंटल इंजीनियरिंग रिसर्च इंस्टीट्यूट, नागपुर

Email: root_neeri@sirnled.ernet.in

◆ इंडियन ऑक्सीलॉजिकल रिसर्च इंस्टीट्यूट, लखनऊ

◆ कॉलेज आफ इंजीनियरिंग, आंध्र यूनिवर्सिटी, विशाखापट्टनम

◆ एलडी कॉलेज ऑफ इंजीनियरिंग, गुजरात यूनिवर्सिटी, अहमदाबाद

www.gujratuniversity.org.in

◆ दिल्ली कॉलेज ऑफ इंजीनियरिंग (यूनिवर्सिटी ऑफ दिल्ली), बवाना रोड, नई दिल्ली।

www.dceonline.net

◆ दिल्ली यूनिवर्सिटी, दिल्ली।

◆ स्कूल ऑफ इनवायरमेंटल साइंसेज, जेएनयू, नई दिल्ली

सौजन्य : अमर उजाला, देहरादून संस्करण, बुधवार, 16 अप्रैल 2008

Wildlife Phot Series for Identification

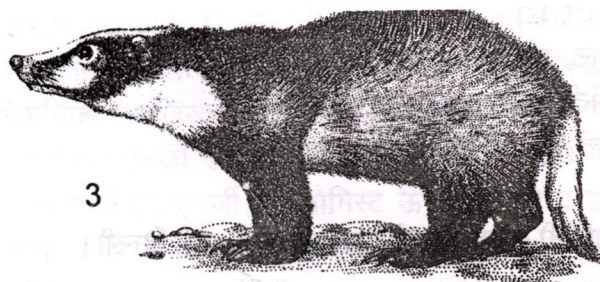
Badgers, Pangolins & Shrews



1



2



3



4

1 The Chinese Ferret-Badger *Melogale moschata*

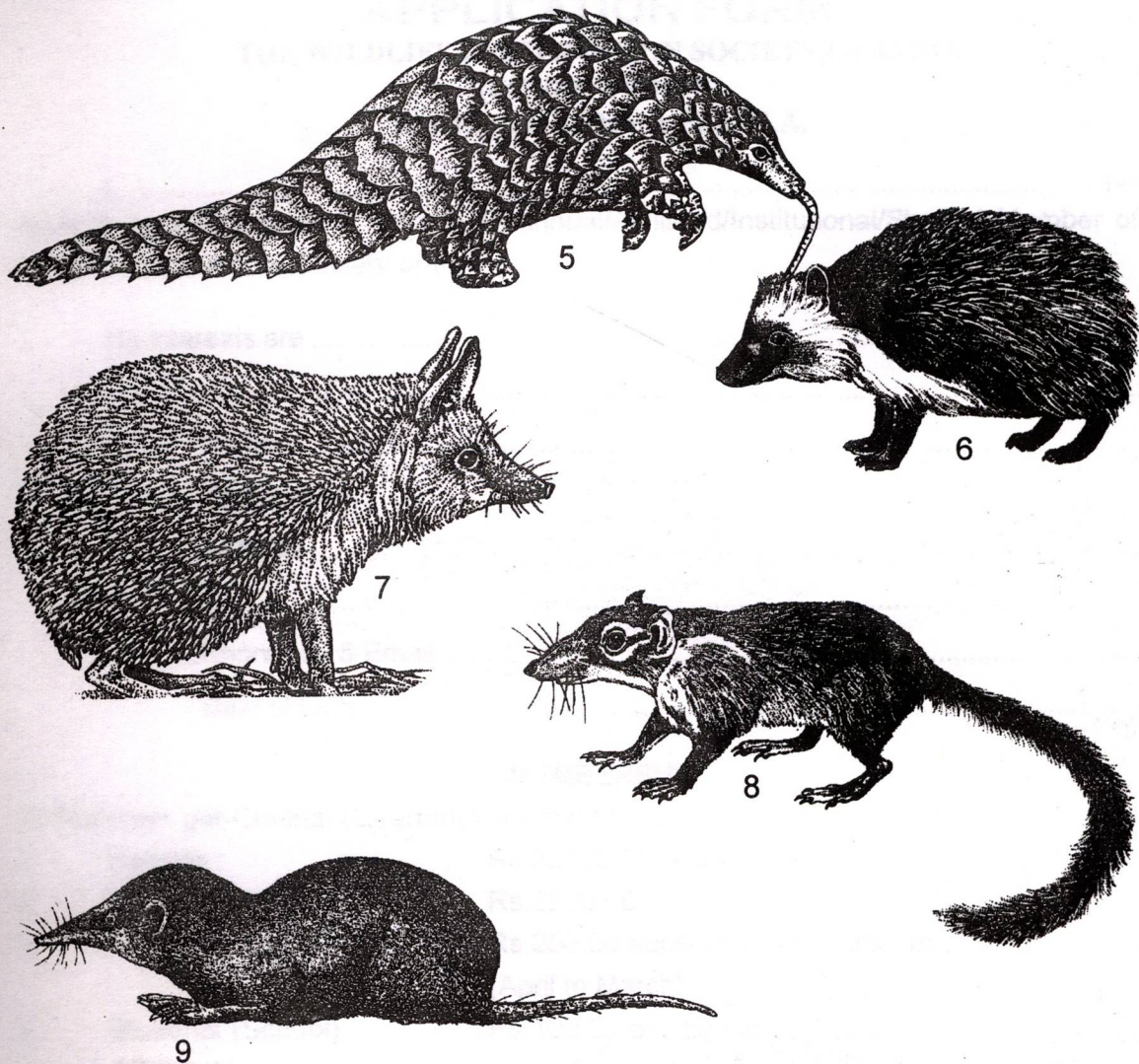
2 The Marbled Polecat *Vormela peregusna*

3 The Hog-badger *Arctonyx collaris* Local Name, Hindi bala sur (bear-pig),

4 The Ratel, or Honey Badger *Mellivora capensis* Local Names Hindi bejoo, bajra; bal, reencha in north and central India; sindhi gorpai; Cutch ghurnar; Tel. bigu khawar; Tamil and Kan. tarakaradi

Wildlife Phot Series for Identification

Badgers, Pangolins & Shrews



- 5 **The Indian Pangolin** *Manis crassicaudata* **Local Names.** Hindi bajra kit, bajra kapta, suraj mukhi, silu, sal sala; Mar. thirya khauli mah, khawala manjar, kassoli manjar; Tel. alawa ; Tamil & Mal. alangu; Bur. thing wegyat.
- 6 **The Pale Hedgehog** *Paraechinus micropus*
- 7 **The Longeared Hedgehog** *Hemtechinus auritus*
- 8 **The Indian Tree Shrew** *Anathana ellioti*
- 9 **The Grey Musk Shrew** *Suncus murinus* **Local Names** Hindi chuchunder: Mar chichundri; Kan chundli; English Musk Rat



Phone : 0135-2652410

APPLICATION FORM

THE WILDLIFE PRESERVATION SOCIETY OF INDIA

(Established 1958)

7, Astley Hall, Dehra Dun, U.A.

I, hereby
apply to be admitted as a Patron/Life/Annual/Affiliated/Institutional/Student Member of the
Wildlife Preservation Society of India.

My interests are

Name

Designation

Address

Phone No. & Email

Date of Birth

MEMBERSHIP

All Members get Cheetal (Quarterly) Journal FREE

- | | | |
|----|---|--|
| 1. | Patrons : | Rs.25000.00 and above |
| 2. | Life : | Rs.2500.00 |
| 3. | Annual : | Rs.250.00 subscription per annum
(April to March) |
| 4. | Students (School) | Rs.100.00 per annum |
| 5. | Affiliated : | |
| | (Others similar bodies) | — — — |
| 6. | Institutional | |
| | (Messes, Units, Schools, Colleges,
Govt. Deptts., Corporations,
Societies, NGOs etc.) | Rs.400.00 per year |
| 7. | Institutional Life | Rs.3500.00 |

All Communications may please be addressed to the Hony. Secretary.

Signature

The Wildlife Preservation Society of India

1. The aims and objects of the Society are as follows :-

- (a) To promote interest and impart knowledge regarding the preservation and conservation of all forms of wildlife, particularly among the youth of the country.
- (b) To cooperate with the Govt. of India and State Governments and with others Societies and Institutions having similar aims and objects in working for the interests of wildlife.
- (c) To assist in enforcing and actively supporting the Forests Acts. Wild Birds and animals Protections Acts and Rules etc. of State Governments and the Indian Arms Act and Rules in so far as they pertain to wildlife and to bring to the notice of the authorities any infringement of the same and to assist in the detention and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wildlife administrators in the formation, maintenance and protection of Sanctuaries and National Parks, preservation of wildlife in general and endangered species of India in particular and in the introduction of exotic species into the country, rehabilitation of endangered species etc. and in the formulation and amendments of rules and acts, so as to conserve and increase wildlife stocks.
- (e) To raise funds for carrying out the above aims and objects and to found and maintain museums reading rooms and libraries of natural history in order to disseminate knowledge regarding wildlife.
- (f) To carry out publicity and propaganda for the preservation of wildlife in India by means of monographs, journals, films, filmstrips and other feasible methods.
- (g) To assist members of the Society in obtaining facilities for viewing and photographing wildlife in India.
- (h) To conduct research into the problem of Wildlife management in India, and in pursuance of this, to initiate, encourage and, where possible assist in the projects of the study of threatened species and related objects and to provide reference and research facilities for such work.
- (i) To carry on such other activities which will serve the above subjects.

2. What membership of Wildlife Preservation Society of India will entitle you to ?

- (1) You will become an active member of the growing group of Wildlife enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of wildlife for posterity.
- (2) You will be entitled to the full use of the library of the Wildlife Preservation Society and of its reading room.
- (3) You will receive a membership certificate.
- (4) You will receive a personal Identification and Membership Card.
- (5) You will be entitled to buy all publications of the Society at a concessional rate.
- (6) You will be entitled to buy at concessional rates the Societies Greeting Cards, Calendars. Tie, Label badges and the Balance of Nature Game (specially Published in colour for its educative and recreational values).
- (7) You will be supplied "Cheetal", the quarterly journal of the society free.

3. For membership particulars write to Honorary Secretary, Wildlife Preservation Society of India 7 Astley Hall, Dehra Dun.

The Wildlife Preservation Society of India

Working President

Shri N.N. Goel Advocate
11-A Nemi Road
Dehradun - 248 001

Executive Vice President

Shri A.S. Negi, IFS (Retd.)
Ex Advisor (Wildlife) Govt. of Uttarakhand
300 Model Colony, Araghar
Dehradun - 248 001

Other Vice Presidents

Shri Ravi Singh
Secretary General & CEO, WWF- India
172, B Lodhi Estate
New Delhi - 3

Shri P.R. Sinha (Ex Officio)
Director, Wild Life Institute of India
Post Box 18, Chandrabani
Dehradun

Dr. R.B.S. Rawat IFS
Principal Chief Conservator of Forests, Uttarakhand
85, Rajpur Road, Dehradun - 248 001

Shri S. Chandola, IFS
Add. PCCF & Chief Wildlife Warden, Uttarakhand
Camp Office-Chandrabani, Dehradun

Honorary Secretary

Shri I.S. Negi, IFS (Retd.)
12, Sewak Ashram Road,
Dehradun - 248 001

(Ex Officio) Hon. Asst. Secretary

Shri Narendra Singh
21/2-3, Teg Bahadur Road No.4
Dehradun - 248 001

Honorary Treasurer

Dr. S.P. Singh
9A Sewak Ashram Road,
Dehradun - 248 001

Editorial Board

1. A.S. Negi

2. Purva Mehta

3. Dr. S.P. Singh

Edited by A.S. Negi, Purva Mehta and Dr. S.P. Singh, published by Executive Vice President for the Wildlife Preservation Society of India 7, Astley Hall, Dehradun and Printed by Sourabh Upadhyay at Ankan, 34, Karanpur, Dehradun.